

THE FORGOTTEN FIRST CHECKLIST OF THE IOWA FLORA: JOHN HENRY RAUCH'S 1851 "REPORT" TO THE STATE MEDICAL AND CHIRURGICAL SOCIETY

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ABSTRACT

The first major account of Iowa's flora has never been cited in the literature. Compiled in 1851 by Dr. John Henry Rauch of Burlington at the behest of the Iowa State Medical and Chirurgical Society, it was published a full two decades before the supposed first effort toward a state flora by Charles Bessey. Rauch listed 516 species in 93 "natural orders," which equate to 501 species in 84 families as recognized today. This represents 23% of the species known to be native to Iowa plus 15% of the non-native. Eighty-six species not currently documented from Iowa were reported, some of which may represent early extirpations of peripheral populations. Rauch's report was a major achievement, and provides the modern reader with valuable insights into Iowa's flora and the status of botanical work there, just five years after statehood.

RESUMEN

El primer gran compendio de la flora de Iowa no ha sido citado nunca en la bibliografía. Fue compilado en 1851 por el Dr. John Henry Rauch de Burlington por mandato de la Sociedad Médica y Quirúrgica del Estado de Iowa, fue publicado dos décadas antes que el supuesto primer esfuerzo para realizar una flora del estado por Charles Bessey. Rauch listó 516 especies en 93 "órdenes naturales," que equivalen a 501 especies en 84 familias como se conocen actualmente. Esto representa el 23% de las especies conocidas como nativas de Iowa y el 15% de las no-nativas. Se citaron 86 especies no documentadas actualmente para Iowa, algunas de las cuales puede representar eliminaciones tempranas de poblaciones periféricas. El compendio de Rauch fue un gran logro, y aporta al lector moderno valiosos conocimientos de la flora de Iowa y el status de trabajo botánico allí, justo cinco años después de convertirse en estado.

INTRODUCTION

The "first effort toward a flora of Iowa" recognized by Eilers (1975) was the checklist by Bessey (1871); it indeed has been viewed as such by the state's botanists since Arthur (1876) called it "the first and only 'Contribution to the Flora of Iowa' thus far made." Prior mentions of plants from Iowa were few; the "earliest significant record" according to Eilers was Parry (1852). However, the Iowa reports in Parry's catalogue were scattered throughout a work devoted primarily to Minnesota and Wisconsin (Ellsworth 1922). Of the 727 species listed, only 204 (most collected at Davenport in 1847) were explicitly ascribed to Iowa. Some of the remainder in fact were collected in the state, as shown by Parry's notebook in the Putnam Museum (cf. Guldner 1960), and by a brief excerpt published in a local newspaper (Parry 1847), but in the catalogue bore only imprecise localities (e.g., "throughout the Northwest" or "banks of the Mississippi") or no locality at all. A reader of that time could only wonder if a "common" species such as *Mimulus ringens* L. or *Sanguinaria canadensis* L. actually occurred in Iowa or not.

The only earlier mention of Iowa plants which Eilers (1975) knew was Torrey (1843, 1845), which summarized Karl Andreas Geyer's collections from the upper Mississippi watershed (McKelvey 1955). As with Parry (1852), Geyer's work in Iowa was peripheral to a survey of more northerly regions; his specimens from the state were gathered mostly at Spirit Lake, 29 September through 3 October 1838 (Shimek 1915; Bray & Bray 1976).

Recently, I had occasion to delve into the life and career of Dr. John Henry Rauch, a physician who resided at Burlington, Iowa, during the 1850s. In my research, I came across the statement in several biographical sketches (Anonymous 1894a, 1894b, 1894c; Wilson & Fiske 1900; Kelly & Burrage 1920) that Rauch, as a member of the fledgling state medical society, had been appointed to report on "the medical and economic botany of Iowa," a report that was completed and published in 1851.

This came as a complete surprise to me. In 35 years of interest in the Iowa flora, I had seen *no* mention of such a publication. Surely, I thought, if it were of even the slightest botanical merit, it would have been known to Fitzpatrick (1899), Gilly (1947), Shimek (1948), Thorne (1954), or others. I could only assume that it was merely a few pages of quaint narrative about a handful of plants, identified largely by vernacular names of imprecise application. But when I at last located a copy (Rauch 1851a), I was astonished to find that it was an actual checklist of the Iowa flora, in many ways comparable to the first floristic list for Illinois (Mead 1846). It reported twice as many species as Parry (1852), following the nomenclature of leading contemporary botanists. In the quality and quantity of information provided (observations on habitats, phenology, distribution within the state, etc.), it was far superior to the bare-bones listings of Bessey (1871) and Arthur (1876). And it had been completely forgotten!

Rauch's (1851a) report offers a unique glimpse at Iowa's flora just 18 years after settlement began. At that time, the frontier lay a mere 50–75 miles west of the Mississippi River, and the state still contained millions of untilled acres (Plumbe 1839; Galland 1840; Newhall 1841, 1846; Parker 1855). By the time Bessey's (1871) contribution was published, the state was essentially settled and largely in cultivation (Fite 1966). As such, this forgotten first checklist provides valuable insights on the flora of Iowa prior to settlement, and enhances our understanding of how it changed following the advent of widespread agriculture and the closing of the frontier (Thompson 1980; Farrar 1981). It also casts light on a time when floristic study was largely the purview of dedicated amateurs rather than paid professionals (Stuckey 1978, 1984; Rudolph 1988), and on early interest in the therapeutic value of plants, an interest that continues today (Lewis & Elvin-Lewis 1995). The purpose here is to assure for Rauch's report the signal position it deserves in Iowa's botanical history, by carefully analyzing and interpreting the information that it contains.

BIOGRAPHY OF DR. JOHN H. RAUCH

John Henry Rauch (Fig. 1) was born on 4 September 1828 in Lebanon, Pennsylvania, the first of ten children born to Bernhard Rauch and the former Jane Brown (Beatty 1991). He assembled his first herbarium as a student at Lebanon Academy (Lee 1895). After graduating in 1846, he spent a year under the tutelage of local physician and surgeon John Washington Gloninger (1798–1874), himself a student of the eminent botanist-physician David Hosack (Kelly & Burrage 1920). Rauch then enrolled in the medical department of the University of Pennsylvania. Upon completing a thesis on the medicinal value of *Polygonatum officinale* L., he graduated an M.D. on 20 March 1849.

Iowa years.—In March 1850, Rauch came to Burlington, Iowa, to establish his medical practice. Advertisements in local newspapers (Fig. 2) place his offices on Jefferson St. (*Burlington Daily Telegraph*, 9 June 1851); on Main St. (*Burlington Daily Hawk Eye*, 2 March 1853); and on Third St. (*Daily Hawk Eye & Telegraph*, 9 December 1856). Not only did he practice, but he conducted medical research as well, examining the efficacy of topical applications of chloroform in alleviating various conditions (Rauch 1851b), the influence of ozone on health (Lee 1895), and the relationship between burial of cholera victims and spread of the disease (Beatty 1991). His advocacy for the men employed in navigation on the Mississippi resulted in his appointment to the commission charged with selecting sites for U.S. Marine Hospital Service facilities, one of which was located in Burlington (Kelly & Burrage 1920; Williams 1951).

On 19 June 1850, Rauch was one of twenty-five physicians who met at Burlington to establish the Iowa State Medical and Chirurgical Society, which in 1856 shortened its name to the Iowa Medical Society (Watson 1894; Fairchild 1927; Lawrence 2003). Rauch played an active role in this organization, serving in turn as Librarian (Ransom 1851), Recording Secretary (Anonymous 1854a), First Vice President (Beatty 1991), and President (Anonymous 1858a, 1859). He was also a founding member of the Des Moines County Medical Society, established in 1852, serving as its first Corresponding Secretary (Beatty 1991).

Rauch's interests in this period were not confined to medicine. As Lee (1895) commented, "He was a man of too enlarged views, and possessed of too much public spirit, to be content with the ordinary drudgery of medical practice, and the mere accumulation of wealth had no charms for him. The natural sciences, on the

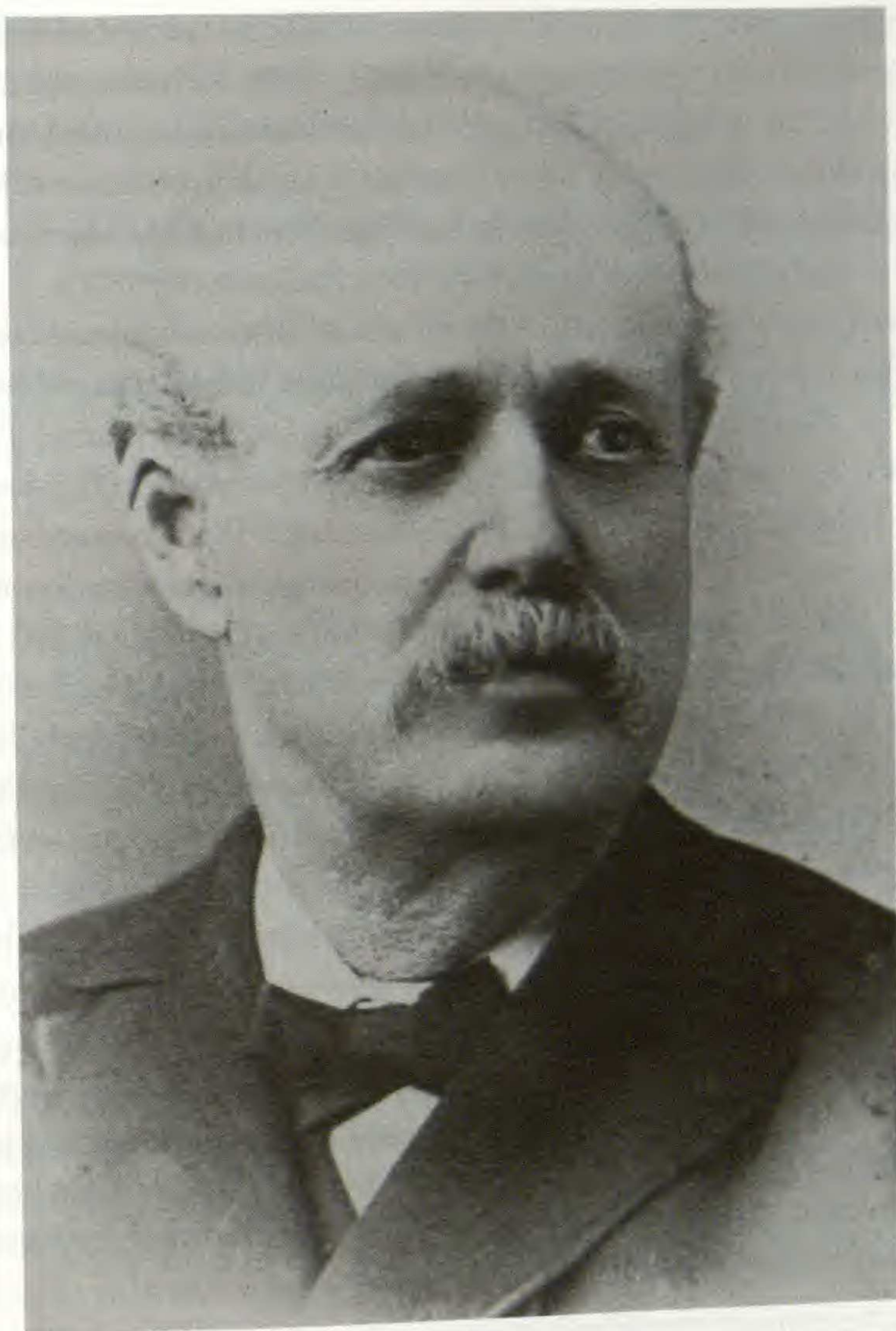


Fig. 1. John Henry Rauch, M.D. (1828–1894). Undated portrait, courtesy of the Galter Health Sciences Library Special Collections, Feinberg School of Medicine, Northwestern University, Chicago, Illinois.


DR. JOHN H. RAUCH,
OFFERS his professional services to the citizens of
 Burlington and vicinity.  He may be found
 at his office over A. Clarke's store, on Jefferson street.
August 15, 50.

Fig. 2. Advertisement for Rauch's medical practice in the *Burlington (Iowa) Daily Telegraph* for 9 June 1851.

other hand, strongly attracted him." Rauch was among those who campaigned for state funding of a geological survey (Kelly & Burrage 1920), which came to fruition in the report of Hall and Whitney (1858). For at least one semester, he was a member of the faculty at Burlington University (cf. Johnson 1855, Abernathy 1907), serving as Lecturer on Natural Sciences (*Daily Hawk Eye & Telegraph*, 10 September 1855). While in Iowa he assembled a large zoological collection, which he took to Louis Agassiz (1807–1873) at Harvard University as houseguest

and private pupil (Anonymous 1894d, Hamilton 1894; Beatty 1991). The celebrated zoologist described several new species of teleost fishes from this collection (Agassiz 1854, 1855), including the cyprinids *Chondrostoma pullum*, *Hypobsis dorsalis*, and *Rhinichthys meleagris*; and *Ichthyobus rauchii*, a catostomid named in his honor. Numerous Rauch specimens were also cited in his monograph of North American turtles (Agassiz 1857). After Agassiz's death, Rauch was appointed to the celebrated zoologist's memorial committee, serving among such luminaries as Henry Cabot Lodge and Oliver Wendell Holmes, Jr. (Lawrence 1876).

Reflecting these broad interests, Rauch was active in at least three other local organizations besides the medical societies. The Iowa Historical and Geological Institute (see below) counted him among its members (Wilson & Fiske 1900); he served at least one term as Recording Secretary (Parker 1855) and at the group's fifteenth anniversary meeting, he was acknowledged for donating 26 examples of Canada's new one-cent coinage (Anonymous 1858b). He delivered the keynote address (Rauch 1853) at the annual meeting of the Southern Iowa Horticultural Society on 20 October 1852. Likely it was through this connection that he "received a great variety of Seeds from the Commissioner of Patents for distribution" to the public (*Daily Hawk Eye & Telegraph*, 20 November 1856). Rauch was also a Mason, a member of Des Moines Lodge, No. 1, in Burlington, and Grand Orator of the Iowa Lodge for 1854 (Parvin 1858). At the national level in these years, he was a member of the Academy of Science of St. Louis (Anonymous 1856), the Chicago Academy of Natural Sciences (Sperry 1904), the Maryland Historical Society (Anonymous 1854b), and the American Association for the Advancement of Science (Anonymous 1857a).

A local eulogist summed up well the high regard felt for Rauch during these years by his fellow Burlingtonians (Anonymous 1894a):

He was a leader in the society of his day and no event of importance was deemed complete without him. He was always foremost, too, on all public occasions of a semi-social character, as the opening of the [Chicago, Burlington, and Quincy Railroad], etc. He was a great admirer of ladies and was highly esteemed in turn, yet died a bachelor. A street in Northern addition was named Rauch in his honor, but some supersapient city council saw fit to change the name to Garnet, thus defeating the purpose of perpetuating the memory of a one time prominent citizen.

Military service.—In response to the federal government's call for volunteers to oppose the secession of southern states, Rauch enlisted in the Army Medical Service in May 1861 (Lee 1895; Sperry 1904). He served at the First Battle of Bull Run and was afterwards made brigade surgeon. After posting to Arlington, Virginia, he became assistant medical director for the Army of the Potomac, in which capacity he participated in the Battle of Cedar Mountain, the Second Battle of Bull Run, and the Battle of Antietam. Early in 1863, he was transferred to the Army of the Gulf, serving as special medical inspector and participating in the Siege of Port Hudson and the Second Battle of Sabine Pass. Relieved from combat-zone duty in 1864, he was appointed medical director at Fort Wayne in Detroit, Michigan, and then at the army post in Madison, Indiana. At the latter posting, he was brought before a board of inquiry by a malicious subordinate on an array of charges, but all were found to be without merit (Beatty 1991). He was brevetted lieutenant colonel effective 13 March 1865 and honorably discharged on 14 July 1865 (Anonymous 1887).

Chicago years.—In 1857, Rauch became Professor of Materia Medica at Rush Medical College in Chicago, Illinois, though he maintained his residence in Burlington until autumn 1858 (Wilson & Fiske 1900; Beatty 1991). Early the next year, he resigned this position. That September, he became Professor of Materia Medica at the Chicago College of Pharmacy, the first such school west of the Alleghenies and one of the predecessors of today's University of Illinois at Chicago (Hamilton 1894). Upon his return from military service, Rauch became interested in the relationship between urban land use and public health (Wilson & Fiske 1900). He criticized contemporary burial practices as all-too-conducive to the contamination of groundwater and spread of disease (Rauch 1866, 1885), and advocated the planting of trees and the development of public parklands as a means of promoting salubrity (Rauch 1853, 1869). These efforts intersected in the closure of the decrepit City Cemetery and its rehabilitation as an addition to Lincoln Park (Beatty 1991; Szczygiel & Hewitt 2000).

In 1867, Rauch was appointed to a six-year term on the city's newly created Board of Health, where he

served as sanitary superintendent in the office of sanitary inspectors. His tenure with this agency was a constant battle with powerful commercial interests polluting the Chicago River. "By simply shutting his eyes at any time during that period, he could undoubtedly have secured an independent fortune. But his sturdy 'Pennsylvania Dutch' ancestry forbade the thought of any such venal dereliction" (Lee 1895). An even greater challenge came in the aftermath of the catastrophic conflagration of October 1871, when he was responsible for the health of 112,000 homeless citizens (Hamilton 1894). When smallpox appeared in the refugee camps, he obliged everyone there to be vaccinated, thus preventing calamity (Lee 1895). In recognition of his preeminent experience as a sanitarian, he was elected president of the American Public Health Association in 1876 (Rauch 1878; Davenport 1957).

Despite his professional focus on sanitation and public health during these years, Rauch maintained a strong interest in natural history. In the winter of 1870–71, he traveled to Venezuela to study sanitary conditions for the Orinoco Mining and Exploring Co. (Beatty 1991). Here "he made a large and valuable collection of natural objects for the Chicago Academy of Natural Sciences" (Sperry 1904). Unfortunately, no Rauch specimens of any sort are to be found in the Academy's collections today; likely all were destroyed in the firestorm of October 1871 (Dawn Roberts, pers. comm.). Rauch's personal herbarium, a manuscript entitled "Synopsis of the Flora of the North West," and all of his notes from his South American sojourn were also lost in that historic conflagration (Beatty 1991).

In 1877, the Illinois legislature created the State Board of Health. Rauch, after more than a decade of service to Chicago in this field, was an obvious candidate for membership. He was elected the Board's first president, and then served as secretary the remainder of his tenure (Anonymous 1894b; Davenport 1957). For the next 15 years, he crusaded against "untrained and unscrupulous pretenders to the medical arts" (Lee 1895), "the quacks and charlatans who were preying upon the public, who could not pass an examination in the profession which they claimed to be qualified to practice; who imposed upon the credulity of the ignorant, and wrung the last dollar from the victims of hopeless disease on pretense of being able to effect their cure" (Anonymous 1891). To do this, he rigorously and uncompromisingly enforced the provisions of the Practice of Medicine Act (Percy 1908). Under this 1877 law (cf. Anonymous 1882a), the State Board of Health verified the genuineness of the medical school diploma of every person practicing medicine in Illinois; if a physician was not a medical school graduate (as was often the case in the Nineteenth Century), he was subjected to an examination to determine his qualifications to practice (Webster 1909). During the first 18 months of its existence, this law compelled almost 40% of Illinois' 3600 non-graduate physicians to cease practicing in the state (Anonymous 1894d). "What the entire American Medical Association failed to effect by resolution and declamation through a series of decades, he accomplished in as many years by the simple expedient of establishing a standard of medical acquirement in the west to which the colleges in the east were compelled to conform" (Lee 1895).

These efforts earned Rauch many enemies – powerful enemies with powerful allies in the state legislature (Webster 1909). In both 1889 and 1891, the Board's biennial appropriations were held hostage to demands by legislators for his resignation. Newspapers aligned with the Democratic Party printed calumnious editorials, calling Rauch "obnoxious ... exceedingly arbitrary in some cases, while in others ... over lenient. ... his acts generally have been such as to create the feeling that he was either corrupt or incompetent" and accusing him of paying bribes to prevent revelation of damning facts about his personal integrity (Anonymous 1892a). Republican newspapers rushed to his defense, pointing out that "No capable physician was his enemy, no community where he had checked disease, or prevented the incursion of epidemics, opposed him, only those whose empiricism was exposed by his efforts to protect the people" (Anonymous 1891). The embattled Rauch finally resigned, effective 30 June 1891.

In November 1893, Rauch returned to his hometown in Pennsylvania, "wearied, worried, despondent and in ill health" (Guilford 1908). Here he took up residence in the home of his youngest brother, Cyrus (Anonymous 1894e; Beatty 1891). He died there of heart failure on 24 March 1894, and was buried in Mount Lebanon Cemetery (Lee 1895).

PREPARATION OF THE "REPORT"

At its inaugural meeting in June 1850, the Iowa State Medical and Chirurgical Society passed a resolution calling for the preparation of a report on plants of medicinal and other economic value that were to be found in the state (Matthews 1850). The committee appointed to carry out this task was chaired by Dr. John W. Brookbank of Burlington (Anonymous 1850); its other members were Rauch and Dr. John F. Dillon of Farmington (Matthews 1850, Sanford 1850). Regarding this committee and its charge, Sanford (1850) commented,

The floral riches of this beautiful and charming state seem almost inexhaustible, and no one doubts that, amidst this profusion of nature's eloquent and poetic beauties, mines of medicinal wealth exist, from which the balm to many an ill, incident to our country, may be bountifully drawn. Numerous as are the blessings which spring from the bosom of our mother earth, they may be greatly multiplied by the assiduity of the medical botanist, and we sincerely trust a larger proportion of our physicians may be found devoting their attention to this subject. Our medical plants should be known and accurately classified in order that we may resort to the great storehouse of nature—the fields and the forests—where no mercenary hand mingles with their life-giving principles, the seeds of death.

The finished report was read by Rauch at the Society's second annual meeting, held on 7 May 1851 in Fairfield. He stated that preparation of the report fell to him "in the absence of the chairman of the committee." In fact, neither Brookbank nor Dillon was practicing medicine during most of the year between the committee's formation and the presentation of the report, and all evidence points to Rauch as sole author.

John Forrest Dillon (1831–1914) was at that time but 19 years old. He was one of five graduates that spring from the College of Physicians and Surgeons of the Upper Mississippi in Davenport, a forerunner of the University of Iowa School of Medicine (Watson 1894), and was en route to Farmington to commence practice (Stiles 1909). There he discovered that a medical condition (an inguinal hernia) made it very painful for him to ride horseback, a requisite for a physician in that rough and thinly settled country. By that autumn, he had given up the practice of medicine, though not his membership in the Society (Anonymous 1854a) and not before publishing on one of his cases (Dillon 1850). He returned to Davenport, took up the study of law, and was admitted to the Scott County bar two years later. His career as a jurist was long and illustrious. He founded and for many years edited the *Central Law Journal*, was elected to the state Supreme Court (Chief Justice 1868–69), and served as a professor of law at Columbia University and later Yale (Gue 1903).

Little is known about John W. Brookbank (Fairchild 1927). He was apparently the first physician to practice at Wapello in adjacent Louisa County, and represented that county at the 1844 state constitutional convention (Springer 1912). Some time later, he moved to Burlington and entered a partnership with Dr. H. Houghton; that affiliation was dissolved "by mutual consent" two months before the founding of the Society (*Burlington Hawk Eye*, 11 April 1850). The next we hear of him is a year after the meeting, when he announced that he "has resumed the Practice of Medicine" (*Burlington Hawk Eye*, 19 June 1851). Taken together, these notices suggest that he, like Dillon, may not have been in a position to assist the committee during the year following his appointment.

In his introduction, Rauch acknowledged that not every medicinal species to be found in Iowa was included. This lack of completeness he attributed to two factors. First, there had been very little botanical exploration in Iowa prior to that time, which meant that he could not rely upon existing literature or collections to any significant extent. Second, because Rauch had been in the state a mere three months when the project began, his personal knowledge of its flora was quite meager. As a result, he assembled the information embodied in his report from three sources.

Field studies.—As soon as the 1850 meeting ended, "I endeavored to gain as much information as I possibly could by personal observation, at the same time collecting *all* the indigenous medicinal plants, so that by the end of the season I had quite a fine collection. It was my purpose to have presented *duplicates of each plant* to the Society at this meeting" [*italics mine*]. This would seem to imply that every name in the report was documented by one or more herbarium specimens in duplicate, all gathered between mid-June and the close of the 1850 growing season. Localities reported were Burlington, Keokuk, "North part of State," "Lakes N.W. part of

State," "S.W. of state," and the Cedar, Wapsipinicon, and Missouri Rivers, which would imply that Rauch traveled the length and breadth of the state while collecting. In light of the fact that Iowa had not a single mile of operating railroad at that time, this would have been a considerable undertaking.

The enticing prospect that herbarium specimens exist to vouch for this forgotten checklist are dashed as soon as they are raised. In the very next sentence, Rauch stated, "unfortunately my specimens were all destroyed." How and when this calamity befell was not indicated, but it must have happened sometime after Rauch identified the specimens, but before he presented the report.

Curiously, it would seem that this was not the only herbarium in Burlington that was destroyed in this period. The Iowa Historical and Geological Institute was an amateur scientific society founded at Burlington in 1843 (Newhall 1846; Jewett 1850; Rhees 1859). According to Parker (1855), its holdings included "an herbarium containing the greater portion of the plants found in the State." All of the Institute's collections were destroyed on 16 January 1853, when the building housing them burned to the ground (Anonymous 1853a, 1853b, 1857b).

The existence in the 1850s of two herbaria in Burlington, both purporting to represent well the flora of the entire state, seems odd. If the Institute's herbarium was in existence when Rauch was preparing his report, why did he not rely on it for information? As a member (Parker 1855; Wilson & Fiske 1900), he would have known about it. One possibility is that there has been some confusion and the herbarium mentioned by Parker (1855) was actually Rauch's, destroyed prior to May 1851. Alternatively, Rauch may have carried out his intention, as stated in the introduction of his report, to rebuild the lost collection "at some future period;" his address to the Southern Iowa Horticultural Society (Rauch 1853) does allude to botanical collecting during the summer of 1852. If this had been done under the aegis of the Institute, he once again would have lost his herbarium when their building burned.

Botanical literature.—Rauch also availed himself of such publications as were available, specifically "the various reports of the Geological and other explorations made of this state by the Government." This might be an allusion to Torrey (1843, 1845), but if so, Rauch did not take up all of the species listed therein. Parry's (1852) full report had not yet been published, though an excerpt had been printed (Parry 1847) and may have been known to Rauch (see below). But again, he did not take up all species listed there. Other government surveys (e.g., Pike 1810; Allen 1814; Lea 1836; Allen 1846) did not contain any formal botany, though the descriptive accounts of Plumbe (1839) and Galland (1840) did list a number of useful plants by their common names.

The literature mentioned by Rauch also included "works of Torrey [sic] and Gray, Bigelow, Rafinesque, Riddel [sic], Eaton, Nuttall, James, Wood, Griffith's Medicinal Botany, and the U.S. Dispensatory of Wood and Bache." The last two (Griffith 1847; Wood & Bache 1836) no doubt were sources for information on medicinal use. Most of the remainder (e.g., Nuttall 1818; Torrey 1824; Eaton & Wright 1840; Gray 1848) likely were used as guides to identification and nomenclature, rather than as documentation for any species' occurrence in Iowa. To the best of my knowledge, the only plants reported from Iowa in such works were *Aster sericeus* and *Prenanthes alba* by Wood (1847), and *Callirhoe triangulata* by Gray (1849); the latter two appear in Rauch's report but not the first. However, the reports of species from the environs of the Missouri River (see above) may have been derived from the literature. Rauch seems to have felt that if Pursh (1814), Nuttall (1818), or James (1823, 1825) reported a species from "the plains of the Missouri" (e.g., *Artemisia santonicum*, Pursh 1814; *Gentiana acuta*, Nuttall 1818), it could be assumed to occur in western Iowa. In fact, these explorers did not encounter such plants until much farther upstream.

Other botanists.—Rauch's third source for his report was information obtained from three other men interested in botany. The first, whom he acknowledged "for much valuable information," was Dr. Edwin James (1797–1861). James was a student of both John Torrey and Amos Eaton (Aldrich 1899; Wood 1955). In 1820, he served as botanist and geologist on Maj. Stephen Long's expedition to explore the Rocky Mountains, where he led the first recorded ascent of Pike's Peak (Goodman & Lawson 1995). Upon completing his report of the expedition (James 1823, 1825; Torrey 1828), he secured an appointment as an assistant surgeon in the Army's medical department (Benson 1968), during which time he assisted John Tanner in publishing his captivity

narrative (James 1830). In 1833 he retired from medicine and three years later settled on a farm southwest of Burlington, where he spent the remainder of his days as an active advocate of abolition and temperance (Frazee 1899; Pammel 1907–08). In the body of his report, Rauch related information that he received from “my friend Dr. James” on the use of *Eupatorium perfoliatum* as malarial prophylaxis, as well as reporting the occurrence of *Trillium nivale* on James’ farm.

The second man acknowledged was Alfred Sanders (1819–1865), “who has done much as an amateur botanist toward exploring and collecting the Flora of this State.” Sanders was owner, publisher, and editor of *The Davenport Gazette*, which he had founded upon his arrival in 1841 (Gue 1903); it was this newspaper that had published Parry’s (1847) summary of his Iowa collecting. “In early life he made botany a specialty, and was very successful in its prosecution. During the first year of his residence in Iowa he spent much time in the prairies and woods making collections of plants, analyzing and classifying them” (Anonymous 1882b). In Parry’s (1847) list, Sanders was credited with collecting *Penstemon grandiflorus* Nutt. on the Cedar River, a species not listed by Rauch.

The final man mentioned was David Sylvester Sheldon (1809–1886), who (along with Rauch and Sanders) would “be happy to exchange [plant] specimens with persons of this or any other State.” Sheldon was Professor of Natural Science at Iowa College in Davenport, the forerunner of Grinnell College. Here, he spent considerable time “scouring the adjacent country, securing specimens of plants, shells, fossils, etc., which by an extensive system of exchanges, secured valuable returns from all parts of the world” (Parry 1893). During 1852–54, Sheldon was assisted in these efforts by a tutor at the college, Sereno Watson (1826–1892), who later became curator of the Gray Herbarium at Harvard University (Anonymous 1892b). Together they assembled “a very complete series of local plants ... most of which are now stored in the Davenport Academy [of Natural Sciences] Herbarium” (Parry 1893). Sheldon was the first president of that institution (Pratt 1882), which was the forerunner of the Putnam Museum.

Publication.—The report was approved and ordered printed as part of the proceedings of the meeting (Ransom 1851). For each of the 516 species recognized, Rauch provided its binomial (avowedly following Torrey & Gray 1838–43), vernacular name(s), and pertinent synonymy, followed by succinct notes on habitat (including locality in some cases), flower color, phenology, and uses. The species were arranged into 93 orders (families in current usage) “according to the natural method, or that of Jussieu.” Sanford (1851) reviewed the finished report favorably:

The report of our friend Dr. J. H. Rauch, also of the City of Burlington, likewise merits the highest commendation. Dr. H. [sic] has the honor of exploring the medical Botany of Iowa, and an attentive examination of his report, will be sufficient to convince any one of the fidelity and zeal with which he has performed his task. We hope his labors will ... constitute a nucleus around which a full collection and classification of our indigenous and naturalized plants may be made.

Subsequent events.—At the conclusion of the Society’s 1851 meeting, Rauch and Dr. Moses Cousins, Jr. (1826–1868), were appointed “a standing committee on Medical Botany” (Ransom 1851; Anonymous 1854a). Cousins, a native of Vermont and an 1850 graduate of Cleveland Medical College, had recently set up practice in Albia (Anonymous 1878, Hickenlooper 1896). Like Rauch, Cousins “was a lover of natural science. Botany was a favorite study with him; he delighted in the examination and cultivation of plants, fruit and ornamental trees, vines, etc. ...” (Anonymous 1869). One might wonder why, given these interests, he had not been appointed to the original *ad hoc* committee instead of Brookbank or Dillon. This was almost certainly because he was not among those present at that first meeting (cf. Matthews 1850; Sanford 1850).

Unlike the original committee, its successor seems to have achieved little. At the Society’s 1852 meeting, held 5 May in Fairfield, “the Committee on Medical Botany was given further time to report” (Anonymous 1854a). In fact, it appears from the official record that neither Rauch nor Cousins was present that day. A number of committees made reports at the Society’s 1853 meeting, held 8 June in Davenport, but there was no mention of the Committee on Medical Botany in the official record (Anonymous 1854a).

The discovery of Cousins’ botanical interest and activity in this period may solve a long-standing mystery

involving species attributed to Iowa by Alphonso W. Wood. As noted above, two species were reported from the state in the second edition of his original *Class-book* (Wood 1847); the collector of the vouchers was not indicated. In his all-new *Class-book* (cf. Merrill 1948), however, Wood (1861) indicated that "Dr. Cousens generously supplied us with the plants of the state of Iowa. His name often appears in our pages." Curiously, Wood did not indicate the doctor's first name or initials, or his city of residence, though these were routinely given for his other contributors. Even those species not explicitly credited to Cousens apparently originated with him. In what remains of Wood's herbarium (cf. Arthur 1884, Rusby 1936) is an undated Iowa specimen of *Tomanthera auriculata* (Michx.) Raf. (NY-29001) collected by "Dr. Cousens." Wood (1861) reported this species from Iowa (as *Gerardia auriculata* Michx.) but did not mention Cousens.

I have seen no unequivocal evidence linking Moses Cousins, Jr., of Albia to Wood or his *Class-book*. Nevertheless, I consider him the most likely candidate to have been the mysterious Iowa contributor. The difference in spelling is no real impediment to this assumption, as Wood was well known for his many typographical errors (Meehan 1881). At ten places in the text, including the protologue of *Pyrus coronaria* var. *ioensis* A. Wood (cf. Lammers 1985, 1998), it was spelled as in the introduction: "Cousens." However, under *Marsilea vestita* Hook. & Grev. (cf. Arthur 1884), it was rendered "Couzens." *Veratrum woodii* was one of the ten species credited to "Cousens," but it was attributed to "Cozzens" when the specimen was cited elsewhere (Wood 1878). In only one instance did Wood's spelling conform to the Iowa physician's name. A revised printing (Wood 1869) was created by replacing a few of the stereotyped pages with newly composed printing plates (Merrill 1948). On one such page, *Aster anomalus* Engelm. was reported from Iowa, and credited to "Cousins."

The last evidence we have of Rauch's botanical activities was his speech to the Southern Iowa Horticultural Society (Rauch 1853). A major portion of this address was devoted to urging the membership to cultivate more plants native to Iowa, particularly those "which grow upon our prairie neglected." He took a dim view of those who knew all the fashionable exotics, "but take them into our fields and forests, and they are not able to distinguish one plant from another." He encouraged the group to "be American in our floriculture as well as in government," asserting that, "our lily, moccasin flower, butter-fly weed, orchis, dogbane, and many others will vie for beauty with any that are found in other parts of the world." He indicated that during the preceding summer (i.e., 1852), he had exhibited attractive native plants at the group's monthly meetings in order to foster greater interest in growing them, and intended to do so in the coming season as well. Whether he actually did so is not known.

DECONSTRUCTION OF THE "REPORT"

Before the botanical significance of Rauch's report can be judged, its core information must be brought into conformity with modern practice, so that rational comparisons may be made. For this purpose I have chosen as a standard of reference Eilers and Roosa's (1994) list of Iowa vascular plants. Although additions to the Iowa flora continue to be made (e.g., Lewis 1998; Norris et al. 2001; Cusick 2002; Thompson 2010), it nevertheless offers the single best summary currently available.

Synonymy.—Names employed to denote plants in century-old literature often differ from those used to denote the same entities today. These differences come about for two reasons. First, classifications are hypotheses, not facts (Donoghue 1987; LaDuke 1987). As such, they change over time, as new data and new methods of data analysis become available (Stuessy 2009). When classifications change (e.g., a species is moved to a different genus, or a subspecies is segregated as a distinct species), names will change as well. Second, the botanical community today has a comprehensive and rigorous set of rules for the naming of plants, the *International Code of Botanical Nomenclature* (McNeill et al. 2006). The bestowing of names prior to the Twentieth Century was governed by little more than custom and caprice; such names often find themselves on the wrong side of current rules and must be brought into compliance.

In many cases, a name used by Rauch is a heterotypic (taxonomic) synonym of one in Eilers and Roosa (1994). For example, Paper Birch was called *Betula papyracea* for many years until it was noticed that the name *B. papyrifera* pertained to the very same species but had been published four years earlier. Silver Maple was

called *Acer dasycarpum* during the many years that its correct name, *A. saccharinum*, was erroneously applied to Sugar Maple (*A. saccharum*). Heterotypic synonyms in the list that follows are denoted by the abbreviation "incl." for "including." Each also bears a parenthetical reference to support the name change. In selecting these references, I have given preference to the eight editions of *Gray's Manual* (Gray 1848, 1856, 1862, 1863, 1867; Watson & Coulter 1889; Robinson & Fernald 1908; Fernald 1950), because this work has long been a primary reference in Iowa. In this way, one has a general idea of when botanists in the state would have begun to use the current name.

A name used by Rauch may also be a homotypic (nomenclatural) synonym of one used by Eilers and Roosa (1994). For example, *Aspidium acrostichoides* (Michx.) Sw. is based on the same type (that of *Nephrodium acrostichoides* Michx.) as *Polystichum acrostichoides* (Michx.) Schott. All three pertain to the same biological entity; they merely differ in the genus to which it is assigned. Most such synonyms are obvious from the uniformity of the final epithet and its author, though sometimes this is not the case. Either way, homotypy is indicated by simply citing the synonym alone, with neither "incl." nor reference.

Some differences have resulted from the earlier misapplication of a name to a taxon that does not include the type of that name. Case in point: the erroneous use of *Acer saccharinum* for Sugar Maple instead of Silver Maple noted above. Such misapplied names are not, properly speaking, synonyms; synonyms are created by differing opinions as to the circumscription, position, and/or rank of a taxon, or by ignorance of priority or homonymy (McNeill et al. 2006). These misapplied names simply represent errors of identification that became established and pervasive in the primary literature. They are denoted in the list below by the abbreviation "misappl." for "misapplied," followed by a parenthetical documentary reference. The work of Jones and Fuller (1955) was especially helpful in sorting out misapplied names, by providing insight into how certain names were used by other Midwestern botanists of the day.

Finally, if a name used by Rauch but not by Eilers and Roosa (1994) is neither a synonym nor a misapplication, it must simply represent an error in identification. Ordinarily, such errors are rectified through examination of voucher specimens. With the loss of Rauch's herbarium, disposition of such names becomes problematic. I have attempted to divine what plant Rauch had in hand by considering what other members of the genus or family are present in Iowa that he did *not* report, which might logically be confused with the unlikely species. In doing so, I have borne in mind the state of botanical knowledge in the 1850s, specifically the reference works used by Rauch. In most cases, I am able to suggest a plausible disposition (e.g., the report of *Betula glandulosa* likely based on material of *B. pumila* var. *glandulifera*). In others, the dubious report must be allowed to stand (e.g., *Xanthorhiza simplicissima*).

Format.—In the following analysis of Rauch's checklist, Rauch's Jussieuean arrangement of taxa is replaced by the sequence used in Eilers and Roosa's (1994) list. Nomenclature also follows this standard, unless the name they used is contrary to the *Code* (e.g., *Quercus borealis*, *Salix rigida*). Rauch's name if different follows in brackets; see the preceding section for details on notation. Most of the ancillary information provided by Rauch (flower color, phenology, uses) is omitted; only his statements on habitat and distribution are retained, set off as quotes. Pertinent information from his address to the Southern Iowa Horticultural Society (Rauch 1853) is quoted for a few species.

Species stated by Eilers and Roosa (1994) to be native to Iowa are in Roman type, while non-natives are in Italic. For the latter, the year it was first documented in the state (Cratty 1929) is given. Species *not* listed by Eilers and Roosa are prefaced with an asterisk; italicizing an asterisked name indicates that it is not native to the United States. Statements regarding the geographic distribution of these supernumeraries are derived from Kartesz (2011).

PTERIDOPHYTES

Adiantaceae

Adiantum pedatum L.—"Rocky woods."

Aspleniaceae

Polystichum acrostichoides (Michx.) Schott [*Aspidium acrostichoides* (Michx.) Sw.]—"Bluffs and rocky woods."

Equisetaceae

Equisetum hyemale L.—"Wet places."

GYMNOSPERMS

Cupressaceae

Juniperus virginiana L.—"Found on Red Cedar River."

**Taxodium distichum* (L.) Rich. [*Cupressus disticha* L.]—"Wet soils."

No nearer than southeastern Missouri or southern Illinois. In his address to the Southern Iowa Horticultural Society, Rauch (1853) said, "Well do I recollect the emotions caused by my seeing the enormous *Cupressus disticha*, planted by Bartram, in his garden near Philadelphia ..." This refers to a tree planted by botanist John Bartram (1699–1777) at his estate on the west bank of the Schuylkill River. Believed to have been transplanted from Florida ca. 1740, the tree attained a height of 175 ft before dying in the 1890s (Williams 1908).

Thuja occidentalis L.—"Border of streams, lakes, &c." Although Eilers and Roosa (1994) did not regard this as native, natural populations are found as near as southeastern Minnesota, southwestern Wisconsin, and northern Illinois.

Pinaceae

Abies balsamea (L.) Mill.—"North part of State."

**Picea mariana* (Mill.) Britt., Sterns & Poggenb. [incl. *Abies nigra* (Ait.) Poir. (Watson & Coulter 1889, Robinson & Fernald 1908)]—As near as eastern Minnesota and southwestern Wisconsin.

**Pinus echinata* Mill. [incl. *P. variabilis* (Ait.) Lamb. (Gray 1848, Robinson & Fernald 1908)]—"North part of State." No nearer than eastern Missouri or southern Illinois. If it were to occur naturally in Iowa, it would be in the southeastern counties, not the north.

**Pinus palustris* Mill.—No nearer than northern Louisiana or central Mississippi, though Mead (1846) reported it as planted in adjacent Illinois.

**Pinus resinosa* Ait.—"North part of the State." As near as southeastern Minnesota, southwestern Wisconsin, and northern Illinois.

Pinus strobus L.

**Tsuga canadensis* (L.) Carr. [*Abies canadensis* (L.) Mill.]—As near as southwestern Wisconsin.

Taxaceae

Taxus canadensis Marsh.—"Shady places."

ANGIOSPERMS: DICOTS

Acanthaceae

Ruellia strepens L.—"Prairies." *Ruellia humilis* Nutt. is far more common in Iowa, but was not treated by Gray (1848).

Aceraceae

Acer negundo L. [*Negundo aceroides* Moench]—"Woods." Reported previously by Parry (1847).

Acer nigrum Michx. f.

Acer rubrum L.—"Low woods. Swamps."

Acer saccharinum L. [incl. *A. dasycarpum* Ehrh. (Robinson & Fernald 1908)]—"Banks of rivers."

Acer saccharum Marsh. [*A. saccharinum* L., misappl. (Robinson & Fernald 1908)]—"Forests."

Acer spicatum Lam.—Referred here is Rauch's report of *A. pennsylvanicum* L., a northern species occurring no nearer than Michigan's Upper Peninsula, as the two are very similar in morphology.

Anacardiaceae

Rhus aromatica Ait.—"On Red Cedar river. Hedges."

Rhus glabra L.—"Second Fields, woods, &c."

Rhus typhina L.—"Rocky places."

Toxicodendron radicans (L.) Kuntze [*Rhus radicans* L.].

Toxicodendron rydbergii (Small ex Rydb.) Greene [*Rhus toxicodendron* L., misappl. (Rydberg 1900)]—"Woods."

**Toxicodendron vernix* (L.) Kuntze [incl. *Rhus venenata* DC. (Robinson & Fernald 1908)]—"Swamps." As near as southern Minnesota, southwestern Wisconsin, and central Illinois.

Annonaceae

Asimina triloba (L.) Dunal [*Uvaria triloba* (L.) Torr. & A. Gray]—"Banks of streams, near Keokuk."

Apiaceae

Angelica atropurpurea L. [*Archangelica atropurpurea* (L.) Hoffm.]—"Fields. Meadows."

Cicuta maculata L.—"Wet prairies."

Conium maculatum L.—"Introduced. Way-sides, &c." Earliest record 1926 (Cratty 1929).

Daucus carota L.—"Introduced. Fields, roadsides." Earliest record 1891 (Cratty 1929).

**Erigenia bulbosa* (Michx.) Nutt.—"Banks of streams." As near as northeastern Missouri and western Illinois.

Eryngium yuccifolium Michx. [*E. aquaticum* L., misappl. (Gray 1856)]—"Wet prairies." Reported previously by Parry (1847).

Heracleum lanatum Michx.—"Low places."

Osmorhiza claytonii (Michx.) C. B. Clarke [*O. brevistylis* DC., nom. illeg.]—"Woods."

Osmorhiza longistylis (Torr.) DC.—"Woods."

Oxypolis rigidior (L.) Raf. [*Archemora rigidior* (L.) DC.]—"Swamps." Reported previously by Parry (1847).

Pastinaca sativa L.—"Introduced. Fields, along fences &c." Earliest record 1895 (Cratty 1929).

Polytaenia nuttallii DC.—"Prairies."

Sanicula marilandica L.—"Woods. Thickets."

Sium suave Walt. [*S. latifolium* L., misappl., and incl. *S. lineare* Michx. (Jones & Fuller 1955)]—"Swamps &c."

Apocynaceae

Apocynum androsaemifolium L.—"Hedges and fields."

Apocynum cannabinum L.—"Waste lands."

Aquifoliaceae

Ilex verticillata (L.) A. Gray [*Prinos verticillatus* L.]—"Shrub swamps."

Araliaceae

Aralia nudicaulis L.—"Woods."

Aralia racemosa L.—"Woods."

**Aralia spinosa* L.—"Woods." No nearer than southeastern Missouri or southern Illinois as a native plant, though reported as an escape from cultivation in Johnson County by Fitzpatrick (1899).

Panax quinquefolius L.—"Woods."

**Panax trifolius* L.—"Low woods." As near as southwestern Wisconsin.

Aristolochiaceae

**Aristolochia macrophylla* Lam. [incl. *A. sipho* L'Hér. (Robinson & Fernald 1908)]—"No nearer than central Kentucky, West Virginia, or western Pennsylvania, though not infrequently cultivated."

Aristolochia serpentaria L.—"Thickets."

Asarum canadense L.—"Rich soil."

Asclepiadaceae

Asclepias amplexicaulis Sm. [incl. *A. obtusifolia* Michx. (Robinson & Fernald 1908)].

Asclepias incarnata L.—“Wet places.”

Asclepias quadrifolia Jacq.

Asclepias syriaca L. [*A. cornuti* Decne., nom. illeg.]—“Low shady grounds.”

Asclepias tuberosa L.—“Sandy places.”

Asteraceae

Achillea millefolium L.—“Fields.”

Anthemis arvensis L.—“Introduced. Fields.”

Anthemis cotula L. [*Maruta cotula* (L.) DC.]—“Introduced. Roadsides.” Earliest record 1881 (Cratty 1929).

Arctium lappa L. [*Lappa major* Gaertn.]—“Waste grounds.” *Arctium minus* (Hill) Bernh. is far more common in Iowa, but was not treated by Gray (1848).

Artemisia biennis Willd.—Reported previously by Torrey (1843, 1845).

Artemisia campestris L. subsp. *caudata* (Michx.) H. M. Hall & Clements [*A. canadensis* Michx., misappl. (Jones & Fuller 1955)]—“Lakes N.W. part of State.”

Artemisia dracunculus L. [incl. *A. dracunculoides* Pursh (Barkley et al. 2006)]—Rauch's report of *A. santonicum* L. from “Banks of Mo.” is referred here also. This is a Eurasian species not known to have ever occurred in North America (Barkley et al. 2006), which may have been included on authority of Pursh (1814). Pursh's report of *A. santonicum* from “the plains of the Missouri” was based upon a specimen from the Lewis and Clark expedition, although no specimen unequivocally tied to that report can now be located (Meehan 1898, Reveal et al. 1999). The name *A. lewisii* Torr. & A. Gray was published (Torrey & Gray 1838–43) for this misidentified plant, and on the basis of its description, Reveal et al. (1999) treated the name as a synonym of *A. dracunculus*.

Conyza canadensis (L.) Cronq. [*Erigeron canadensis* L.]—“Fields.”

Dyssodia papposa (Vent.) A. S. Hitchc. [*D. chrysanthemoides* (Willd.) Lag., nom. illeg.]—“Streets.” Reported previously by Parry (1847).

Echinacea purpurea (L.) Moench—“Thickets.”

Erigeron annuus (L.) Pers. [incl. *E. heterophyllum* Muhl. ex Willd. (Gray 1848)]—“Woods, Fields.”

Erigeron philadelphicus L.—“Woods.”

Eupatorium altissimum L.—“Woods.”

**Eupatorium fistulosum* Barratt—“Thickets.” As near as northeastern Missouri and western Illinois.

Eupatorium maculatum L.—“Low grounds.”

Eupatorium perfoliatum L.—“Prairies.”

Eupatorium purpureum L.—“Prairies, woods.”

Eupatorium rugosum Houtt. [*E. ageratoides* L. f.]—“Woods.”

Helenium autumnale L.—“Wet prairies.”

Inula helenium L.—“Introduced ... Roadsides.” Earliest record 1895 (Cratty 1929).

Krigia biflora (Walt.) Blake [*Hieracium venosum* L., misappl. (Jones & Fuller 1955)]—“Woods.”

Lactuca canadensis L. [incl. *L. elongata* Muhl. ex Willd. (Gray 1867)]—“Hedges, Thickets.”

Liatris pycnostachya Michx.—“Prairies.” Referred here is Rauch's report of *L. spicata* (L.) Willd., a species of very scattered occurrence in southern Wisconsin, Illinois, and southeastern Missouri. The two species are very similar in overall appearance, and *L. pycnostachya* was not treated by Gray (1848).

Liatris squarrosa (L.) Michx.

Parthenium integrifolium L.—“Prairies.”

**Petasites palmatus* (Ait.) A. Gray [*Nardosmia palmata* (Ait.)

Hook.]—“Swamps.” No nearer than central Minnesota and central Wisconsin.

Prenanthes alba L. [*Nabalus albus* (L.) Hook.]—“Woods.” Reported previously by Wood (1847).

Senecio aureus L.—“Woods, Meadows.”

Senecio vulgaris L.—“Introduced. Waste grounds.”

Silphium laciniatum L.—“Prairies.” Reported previously by Parry (1847).

Silphium perfoliatum L.—“Prairies.” Reported previously by Parry (1847).

Silphium terebinthinaceum Jacq.

Solidago nemoralis Ait. [*Solidago odora* Ait., misappl. (Jones & Fuller 1955)]—“Woods, hills.”

Solidago rigida L.—“Prairies.” Reported previously by Parry (1847).

Tanacetum vulgare L.—“Introduced. Fields, roadsides.” Earliest record 1893 (Cratty 1929).

Taraxacum officinale F.H. Wigg. [incl. *T. dens-leonis* Desf. (Watson & Coulter 1889)]—“Fields, &c.” Earliest record 1873 (Cratty 1929).

Vernonia fasciculata Michx.—“Woods and prairies.”

Vernonia missurica Raf. [*V. noveboracensis* Willd., misappl. (Jones & Fuller 1955)]—“Wet prairies.”

Berberidaceae

Berberis vulgaris L.—“Gardens.” Earliest record 1892 (Cratty 1929).

Jeffersonia diphylla (L.) Pers.—“Woods.”

Podophyllum peltatum L.—“Woods.”

Betulaceae

**Alnus serrulata* (Ait.) Willd. [*A. rubra* Bong., misappl. (Furrow 1979)]—“Swamps.” As near as northeastern Missouri.

Betula alleghaniensis Britt. [*B. excelsa* Ait., misappl. (Gray 1867; Furrow 1997)].

Betula nigra L.—“Banks of streams.”

Betula papyrifera Marsh. [incl. *B. papyracea* Ait. (Watson & Coulter 1889)]—“Woods N. part of State.”

Betula pumila L. var. *glandulifera* Regel—Referred here is Rauch's report of *B. glandulosa* Michx., an arctic species with disjunct populations in the Black Hills of South Dakota and northern New England. Both are dwarf shrubs with small leaves and numerous glands.

Carpinus caroliniana Walt.—“Bluffs around Burlington.”

Corylus americana Walt.

Ostrya virginiana (Mill.) K. Koch

Bignoniaceae

Catalpa bignonioides Walt.

Boraginaceae

Cynoglossum officinale L.—“Roadsides.” Earliest record 1895 (Cratty 1929).

**Cynoglossum virginianum* L.—“Wood.” No nearer than eastern Missouri or southern Illinois. In Rauch's day, it encompassed populations later segregated as *C. boreale* Fern., a northern species that comes no closer than central Minnesota or central Wisconsin.

Lithospermum arvense L.—“Fields.”

Lithospermum canescens (Michx.) Lehm.—“Prairies.”

Mertensia virginica (L.) Pers. ex Link—“Bottoms.”

**Symphytum officinale* L.—“Introduced. Gardens, low grounds.” Eurasian cultigen.

Brassicaceae

Armoracia rusticana P. Gaertn., B. Mey. & Scherb. [*Cochlearia armoracia* L.]—“Introduced ... Garden.” Earliest record 1895 (Cratty 1929).

Brassica nigra (L.) W.D.J. Koch [*Sinapis nigra* L.]—“Introduced.” Earliest record 1891 (Cratty 1929).

**Dentaria diphylla* Michx.—“Woods.” As near as southwestern Wisconsin. Isaiah Reid (1836–1911), who graduated from Yellow Springs College in nearby Kossuth in 1861 (Kerwin 2006), told Bessey (1871) that he had collected this in the Burlington vicinity, while Fitzpatrick (1899) reported an 1882 specimen from Hancock County.

Dentaria laciniata Muhl. ex Willd.—“Woods.”

Draba nemorosa L. [*D. nemoralis* Ehrh., misappl. (Fernald 1934)].

Draba reptans (Lam.) Fern. [*D. caroliniana* Walt., misappl. (Fernald 1934)]—“Fields.”

**Erysimum capitatum* (Dougl. ex Hook.) Greene [incl. *E. arkansanum* Nutt. (Rollins 1993)]—Al-Shehbaz (2010) did include Iowa in this species' range, but stated that it is a western species that “has been collected only sporadically” east of the Great Plains.

Nasturtium officinale R. Br.—“Brooks and Ponds ... Cultivated as a salad.” Earliest record 1893 (Cratty 1929).

Rorippa palustris (L.) Bess. [*Nasturtium palustre* (L.) DC.].

Sisymbrium officinale (L.) Scop.—“Fields &c.” Earliest record 1881 (Cratty 1929).

Cactaceae

Opuntia humifusa (Raf.) Raf. [*O. vulgaris* Mill., misappl. (Fernald 1950)]—“Sandy places.”

Campanulaceae

Lobelia cardinalis L.—“Meadows.”

Lobelia inflata L.—“Woods.”

Lobelia siphilitica L.—“Along streams.”

Caprifoliaceae

**Lonicera flava* Sims—“Cultivated for its beauty and fragrance.” Native to the southern states. Listed without comment by Arthur (1876).

Sambucus canadensis L.—“Thickets.”

Sambucus racemosa L. subsp. *pubens* (Michx.) House [*S. pubens* Michx.].

Triosteum perfoliatum L.—“Woods.”

**Viburnum acerifolium* L.—“Woods.” As near as southwestern Wisconsin, and recently collected in northeastern Iowa (D. Q. Lewis, pers. comm.).

Viburnum lentago L.—“Banks of streams.”

Viburnum prunifolium L.—“Woods.”

Viburnum trilobum Marsh. [incl. *V. opulus* L. var. *americana* Ait. (Fernald 1950)]—“Banks of streams. N. part of State.”

Caryophyllaceae

Saponaria officinalis L.—“Introduced.” Earliest record 1894 (Cratty 1929).

Silene virginica L.—“Fields.” Although Eilers and Roosa (1994) regarded this as non-native, natural populations occur as near as southwestern Wisconsin, western Illinois, and northeastern Missouri.

Celastraceae

Celastrus scandens L.—“Climbing shrub in woods and thickets, on trees ... Often planted as an ornamental shrub.”

**Euonymus americanus* L.—“Woods.” No nearer than eastern Missouri or eastern Illinois.

Euonymus atropurpureus Jacq.—Reported previously by Torrey (1843, 1845) and Parry (1847).

Chenopodiaceae

Chenopodium ambrosioides L. [incl. *C. anthelminticum* L. (Gray 1856)]—“Prairies.” Earliest record 1905 (Cratty 1929).

Chenopodium botrys L.—“Sandy fields.” Earliest record 1894 (Cratty 1929).

Cistaceae

Helianthemum canadense (L.) Michx.—“Fields. Woods.”

Hudsonia tomentosa Nutt.—“Shores of lakes N. part of State.”

Convolvulaceae

**Ipomoea batatas* (L.) Lam. [*Convolvulus batatas* L.]—“Introduced.” Cultigen of Central American origin.

**Ipomoea jalapa* (L.) Pursh [*Convolvulus jalapa* L.]—“Sandy places ... Mistaken at one time for the officinal Jalap [i.e., *I. purga* (Wender.) Hayne].” Native of Mexico and Central America.

Ipomoea lacunosa L. [*Convolvulus lacunosus* (L.) Spreng.]—“Hills.”

Ipomoea pandurata (L.) G. F. W. Mey. [*Convolvulus panduratus* L.]—“Sandy places.”

Cornaceae

Cornus amomum Mill. subsp. *obliqua* (Raf.) J. S. Wilson [*C. sericea* L., misappl. (Robinson & Fernald 1908)].

Cornus canadensis L.

Cornus foemina Mill. subsp. *racemosa* (Lam.) J. S. Wilson [incl. *C. paniculata* L'Hér. (Fernald 1950)].

Cornus rugosa Lam. [incl. *C. circinata* L'Hér.; Fernald (1950)].

Cornus stolonifera Michx.—“Woods.”

**Nyssa sylvatica* Marsh. [incl. *N. multiflora* Wang. (Watson & Coulter 1889)]—“Woods.” No nearer than southeastern Missouri or eastern Illinois.

Cucurbitaceae

**Cucurbita pepo* L. [incl. *C. verrucosa* L. (Whitaker 1947)]—“Cultivated by Indians west of Miss. Nutt.” This seemingly is a reference to Nuttall (1818), who stated that *C. verrucosa* was “Cultivated also by the Indians of the Missouri to its sources.” Cultigen of Central American origin.

Droseraceae

Drosera rotundifolia L.—“Swamps.” Pammel (1909) specifically stated that this, like *Sphagnum*, did not occur in Iowa's bogs; the discovery of both was reported by Grant and Thorne (1955).

Ericaceae

Arctostaphylos uva-ursi (L.) Spreng.—“Shrub sandy places N. part of State.”

**Chimaphila maculata* Pursh—“Sandy woods.” No nearer than northeastern Illinois.

Chimaphila umbellata (L.) W. P. C. Barton—“Woods. N. part of State.”

**Gaultheria hispidula* (L.) Muhl. ex Bigel. [*Chiogenes hispidula* (L.) Torr. & A. Gray]—“Shady woods.” No nearer than central Minnesota or central Wisconsin.

**Gaultheria procumbens* L.—“Woods.” As near as central Minnesota, southwestern Wisconsin, and northern Illinois.

Gaylussacia baccata (Wang.) K. Koch [incl. *Vaccinium resinum* Ait. (Watson & Coulter 1889)]—“Woods.”

**Vaccinium corymbosum* L. [incl. *V. virgatum* Ait. (Tucker 2009)]—“Swamps ... Woods.” As near as northern Illinois.

**Vaccinium macrocarpon* Ait. [*Oxycoccus macrocarpon* (Ait.) Pers.]—“Sphagnum swamps.” As near as southern Minnesota and southwestern Wisconsin.

**Vaccinium oxycoccus* L. [*Oxycoccus palustris* Pers.]—“Swamps. N. part of State.” As near as central Minnesota and southwestern Wisconsin. Regarding this and the preceding, Galland (1840) reported that “Cranberries grow in the greatest abundance in the northern parts of the Territory, and are obtained from the Indians by the traders in large quantities.” However, as described in an earlier section of his book, Iowa Territory at that time extended north all the way to the Canadian border.

**Vaccinium stamineum* L.—“Dry Woods.” No nearer than southern Missouri or southern Illinois.

Euphorbiaceae

Acalypha virginica L.—“In dry soils.”

Euphorbia corollata L.—“Dry sandy soil.” Reported previously by Parry (1847).

**Euphorbia ipecacuanhae* L.—“Sandy places.” No nearer than northern Virginia.

**Euphorbia lathyris* L.—“Gardens.” Eurasian cultigen.

Euphorbia marginata Pursh—“Gardens.”

**Ricinus communis* L.—“Cultivated ... This plant thrives well here with a little care, and I have no doubt that it would well pay the farmer for his trouble.” Eurasian cultigen.

Fabaceae

Amorpha canescens Pursh—“Thought to prefer localities where lead exists.” Reported previously by Parry (1847). Parry (1852) explained this reputation as a predictor of mineral deposits thusly: “It attaches itself with most luxuriance to rocky crevices and spots about which the peculiar dry earth, indicating a mineral vein, exists, and the miner is thus guided in making his excavations. Farther than this any definite relation with the lead-bearing rock is sufficiently disproved by the extensive geographical range of this plant.” In his address to the Southern Iowa Horticultural Society, Rauch (1853) said, “... on our elevated and sandy prairies, we have ... *Amorpha canescens*, the flower of which will vie for beauty with the cactus that they take so much pains to cultivate ... I have no doubt if it were generally known ... it would have ere this received their attention, and occupied a prominent place in their gardens.”

Apios americana Medik. [*A. tuberosa* Moench]—“Woods.”

Baptisia lactea (Raf.) Thieret [incl. *B. leucantha* Torr. & A. Gray (Isely 1981)]—“Prairies.” Reported previously by Parry (1847).

Baptisia tinctoria (L.) R. Br.

Cassia marilandica L.

Cercis canadensis L.

Chamaecrista fasciculata (Michx.) Greene [incl. *Cassia chamaecrista* L., nom. rej. (Irwin & Barneby 1982)]—“Dry prairies.” Reported previously by Parry (1847).

Glycyrrhiza lepidota Pursh—“Banks of Miss.”

Gymnocladus dioica (L.) K. Koch [*G. canadensis* Lam.]—“Rare.” Reported previously by Parry (1847).

Pedimelum esculentum (Pursh) Rydb. [*Psoralea esculenta* Pursh]—“Wabsepinecon [Wapsipinicon] river.” The stated locality is somewhat puzzling, as this species’ distribution in Iowa is almost entirely restricted to the western counties (Eilers & Roosa 1994).

Robinia pseudoacacia L.—Earliest record 1895 (Cratty 1929).

Trifolium pratense L.—“Intro.” Earliest record 1880 (Cratty 1929).

Trifolium reflexum L.

Trifolium repens L.—“Pasturage.” Earliest record 1892 (Cratty 1929).

**Trifolium stoloniferum* Muhl. ex Eat.—Known today from only scattered localities in Missouri, Indiana, Ohio, Kentucky, and West Virginia (Melius 2010), though its documented range included eastern Kansas, northern Arkansas, and southern Illinois (Brooks 1983). Reported without comment by Arthur (1876), and from Woodbury County by Fitzpatrick (1899).

Fagaceae

**Fagus grandifolia* Ehrh. [*F. sylvatica* L., misappl. (Gray 1848)]—“Forests.” No nearer than eastern Wisconsin, eastern Illinois, or southeastern Missouri.

Quercus alba L.

Quercus bicolor Willd.

Quercus xbushii Sarg.—Referred here is Rauch’s report of *Q. ilicifolia* Wang.; this species of the Middle Atlantic states occurs no closer than western Pennsylvania. Of all Iowa’s oaks, this hybrid (which

is not infrequent in the southeastern counties; Cooperrider 1957) is the only one which resembles *Q. ilicifolia* in its scraggly habit and lobed wedge-shaped leaves.

Quercus imbricaria Michx.

Quercus macrocarpa Michx.

Quercus marilandica Muenchh. [*Q. nigra* L., misappl. (Robinson & Fernald 1908)].

Quercus muhlenbergii Engelm.—Rauch’s reports of *Q. prinus* L., nom. rej., and *Q. montana* Willd. are both referred to this species, the only chestnut oak in Iowa of arboreal stature; as he states “timber valuable” for *Q. prinus* and “ship building” for *Q. montana*, it is unlikely that either report is referable to *Q. prinoides* Willd., Iowa’s other chestnut oak, as it is a colonial shrub. *Quercus montana* is an eastern species, occurring no closer than southeastern Missouri and southern Illinois, while the name *Q. prinus* has been applied to both *Q. montana* and to *Q. michauxii* Nutt., another eastern species that comes no nearer than southeastern Missouri and southern Illinois (Nixon 1997).

Quercus palustris Muenchh.

Quercus rubra L.—Eilers and Roosa (1994) used the name *Q. borealis* Michx. f., dismissing *Q. rubra* as “nom. ambig.,” but that usage cannot stand (Nixon 1997).

Quercus stellata Wang.

Quercus velutina Lam. [incl. *Q. tinctoria* W. Bartr. (Robinson & Fernald 1908)]

Gentianaceae

**Frasera caroliniensis* Walt.—“Moist woods.” No nearer than southeastern Missouri or central Illinois.

Gentiana andrewsii Griseb.—Rauch’s report of *G. pneumonanthe* L., a Eurasian species, is referred here. Gray (1856) indicated that the plants he had called *G. pneumonanthe* earlier (Gray 1848) were actually *G. linearis* Froel. [as *G. saponaria* L. var. *linearis* (Froel.) Griseb.; cf. Watson & Coulter 1889]. That northeastern species, occurring no nearer than the Upper Peninsula of Michigan, somewhat resembles *G. andrewsii* in shape and color of the corolla.

Gentiana puberulenta J. Pringle—Referred here is Rauch’s report of *G. saponaria* L., a southeastern species that occurs as near as northern Illinois; Gray’s (1848) circumscription of that species included *G. puberula* Michx., the name mistakenly applied to *G. puberulenta* prior to Pringle (1966).

**Gentianella amarella* (L.) Börner [incl. *Gentiana acuta* Michx. (Watson & Coulter 1889)]—“Plains of the Missouri.” No nearer than eastern North Dakota or northwestern Minnesota. Report perhaps derived from Nuttall (1818), who reported it “on the plains of the Missouri, near Fort Mandan.”

Gentianella quinquefolia (L.) Small [*Gentiana quinquefolia* L.]—“Woods.”

**Sabatia angularis* (L.) Pursh—“Wet prairies.” As near as northeastern Missouri and western Illinois. This could be a misidentification of *S. campestris* Pursh (reported from eastern Iowa by Roosa & Eilers 1994); that species was not included by Gray (1848).

Geraniaceae

Geranium carolinianum L.—“Fields.”

Geranium maculatum L.—“Woods.”

Hamamelidaceae

Hamamelis virginiana L.

Hippocastanaceae

Aesculus glabra Willd.—“Bottoms. Universal.” Reported previously by Parry (1847).

Hypericaceae

**Hypericum adpressum* Raf. ex W. Bartr.—As near as western Illinois.

Hypericum canadense L.

Hypericum perforatum L.—"Introduced." Earliest record 1918 (Cratty 1929).

Hypericum prolificum (Spach) Steud.

Hypericum punctatum Lam. [incl. *H. corymbosum* Muhl. ex Willd. (Robinson & Fernald 1908)].

Hypericum pyramidatum Ait.—"Hills. Banks of streams." Reported previously by Parry (1847).

Juglandaceae

Carya cordiformis (Wang.) K. Koch [incl. *C. amara* (Michx. f.) Nutt. ex Ell. (Robinson & Fernald 1908)].

**Carya glabra* (Mill.) Sweet [incl. *C. porcina* Nutt. ex Ell. (Robinson & Fernald 1908)]—As near as northeastern Missouri and western Illinois. Three sheets from Story and Webster Counties have recently come to light at ISC, though their status as planted or native is unclear from their labels (D. Q. Lewis, pers. comm.).

Carya laciniata (Michx. f.) Loud. [incl. *C. sulcata* Nutt. (Robinson & Fernald 1908)]—"Along rivers."

Carya ovata (Mill.) K. Koch [incl. *C. alba* (L.) Nutt., nom. rej. (Robinson & Fernald 1908)].

Juglans cinerea L.—"Bluffs and woods."

Juglans nigra L.—"Forests."

Lamiaceae

Blephilia hirsuta (Pursh) Benth.—"Woods."

**Cunila origanoides* (L.) Britt. [*C. mariana* L., nom. illeg.]—"Dry woods." As near as eastern Missouri and western Illinois.

Glechoma hederacea L. [*Nepeta glechoma* Benth.]—"Hedges, &c." Earliest record 1881 (Cratty 1929).

Hedeoma pulegioides (L.) Pers.—"Prairies, fields."

Leonurus cardiaca L.—"Introduced. Waste places." Earliest record 1887 (Cratty 1929).

Lycopus americanus Muhl. ex W. P. C. Barton [incl. *L. sinuatus* Ell. (Robinson & Fernald 1908)]—"Wet places."

Lycopus virginicus L.—"Wet soil."

Marrubium vulgare L.—"Introduced ... Roads, fields." Earliest record 1914 (Cratty 1929).

**Melissa officinalis* L.—"Introduced. Woods and gardens." Eurasian cultigen.

Mentha arvensis L. [incl. *M. canadensis* L. (Robinson & Fernald 1908)]—"Low places."

Mentha x piperita L.—"Gardens, &c." Earliest record 1903 (Cratty 1929).

Mentha spicata L. [incl. *M. viridis* (L.) L. (Robinson & Fernald 1908)]—"Wet soils." Earliest record 1896 (Cratty 1929).

Monarda fistulosa L.—"Thickets, &c."

Monarda punctata L.

Nepeta cataria L.—"Introduced. Old buildings, &c." Earliest record 1884 (Cratty 1929).

**Origanum vulgare* L.—"Thickets." Eurasian cultigen, sporadically naturalized in the United States, as near as northeastern Illinois.

Prunella vulgaris L.—"Prairies."

**Pycnanthemum incanum* (L.) Michx.—"Rocky Woods." No nearer than southern Illinois.

Pycnanthemum pilosum Nutt.—"Low grounds."

Scutellaria incana Biehler [incl. *S. canescens* Nutt. (Fernald 1950)].

**Scutellaria integrifolia* L.—"Dry places." No nearer than northern Arkansas or western Kentucky. Based on habitat, the report could be referable to *S. leonardii* Epling.

Scutellaria lateriflora L.—"Low prairies."

Scutellaria nervosa Pursh—"Banks of streams."

Scutellaria ovata Hill [incl. *S. cordifolia* Muhl. ex Benth., nom. illeg. (Epling 1942)].

Scutellaria parvula Michx.—"Prairies." Reported previously by Parry (1847).

Lauraceae

**Lindera benzoin* (L.) Blume [*Benzoin odoriferum* Nees]—"Moist woods." As near as northeastern Missouri and western Illinois; reported from "Southern Iowa" by Parry (1852).

Sassafras albidum (Nutt.) Nees [*S. officinale* Nees & C. H. Ebermaier, misappl. (Fernald 1950)]—"Forests, bluffs near Keokuk."

Linaceae

Linum medium (Planch.) Britt. var. *texanum* (Planch.) Fern.—"Woods." Referred here is Rauch's report of *L. virginianum* L., a species coming as near as central Missouri and western Illinois. Both are perennials with yellow corollas and depressed-globose fruits.

Linum usitatissimum L.—"Introduced ... The cultivation of this plant deserves the attention of our farmers, as there is no doubt it would well repay their trouble." Earliest record 1895 (Cratty 1929).

Loganiaceae

**Spigelia marilandica* (L.) L.—"Woods." No nearer than southeastern Missouri or southern Illinois.

Lythraceae

Cuphea viscosissima Jacq.—"Wet grounds."

Lythrum alatum Pursh—"Damp grounds."

Rotala ramosior (L.) Koehne [incl. *Ammannia humilis* Michx. (Watson & Coulter 1889)]—"Wet places."

Malvaceae

Callirhoe triangulata (Leavenw.) A. Gray [incl. *Malva houghtonii* Torr. & A. Gray (Gray 1849)]—"Prairies." Rauch's inclusion of both *C. triangulata* and *M. houghtonii* likely was due to confusion occasioned by the changing treatment of these plants in Rauch's primary references. Torrey & Gray (1838–43) recognized *M. houghtonii*, but included *M. triangulata* Leavenw. (the basionym of *C. triangulata*) within *M. papaver* Cav., a southern species. Subsequently, Gray (1848, 1849) segregated *M. triangulata* from *M. papaver* (assigning *M. houghtonii* to it as a synonym) and specifically reported the species from Iowa.

Malva neglecta Wallr. [*M. rotundifolia* L., nom. rej., misappl. (Fernald 1950)]—"Naturalized. Common." Earliest record 1890 (Cratty 1929).

Malva sylvestris L.—"Naturalized. Fields, gardens." Earliest record 1893 (Cratty 1929).

Napaea dioica L.—"Rich calcareous soil."

Melastomataceae

Rhexia virginica L.—"Wet grounds."

Menispermaceae

Menispermum canadense L.—"Woods."

Menyanthaceae

Menyanthes trifoliata L.—"Swamps, &c."

Moraceae

Cannabis sativa L.—"Introduced ... Cultivated for the sake of its fibre ... The cultivation of hemp should engage the attention of our farmers as it thrives well, and the cultivator is amply remunerated for his trouble, such is the experience of Mr. Williams of Burlington." Earliest record 1894 (Cratty 1929).

Humulus lupulus L.—"Hedges ... Cultivated for the sake of its fertile aments, which are used as a preservative in beer. This is also well worthy of the attention of our farmers."

Maclura pomifera (Raf.) C. K. Schneid. [incl. *M. aurantiaca* Nutt. (Robinson & Fernald 1908)]—"Cultivated for hedges. Thrives well." Earliest record 1892 (Cratty 1929).

Morus rubra L.

Myricaceae

**Comptonia peregrina* (L.) J. M. Coult. [incl. *C. asplenifolia* (L.) L'Hér. ex Ait. (Fernald 1950)]—"Woods and hills." As near as northeastern Minnesota, southwestern Wisconsin, and northern Illinois.

Nymphaeaceae

Nelumbo lutea Willd.—"Bottoms, N. and E. of Burlington and S. W. of Keokuk." In his address to the Southern Iowa Horticultural Society, Rauch (1853) stated, "Many will no doubt be surprised when I say that we have a rival in *Nelumbium luteum* [sic], for the famous *Victoria regia*; it is found growing in the waters of our own Mississippi, and I have no doubt would be as all other plants could be greatly improved by cultivation. ... while the *Victoria regia* only gives pleasure to the sight and calls forth our admiration, the *Nelumbium luteum* [sic], helps to nourish and sustain the life of the wandering Indian ..."

Nuphar lutea (L.) Sibth. & Sm. subsp. *variegata* (Engelm. ex Durand) E. O. Beal [*N. advena* (Ait.) Ait. f., misappl. (Wiersema & Hellquist 1997)].

Nymphaea tuberosa Paine—"Pond's [sic]." Referred here is Rauch's report of *N. odorata* Ait. The two are treated by Wiersema and Hellquist (1997) as conspecific subspecies and Iowa's plants assigned to *N. odorata* subsp. *tuberosa* (Paine) Wiersma & Hellquist.

Oleaceae

Fraxinus americana L.—"North part of State."

Fraxinus nigra Marsh. [incl. *F. sambucifolia* Lam. (Robinson & Fernald 1908)]—"Swamps. North part of State."

Fraxinus quadrangulata Michx.—"Woods."

Onagraceae

Epilobium angustifolium L.—"Meadows."

Epilobium coloratum Biehler.

Epilobium leptophyllum Raf. [*E. palustre* L., misappl. (Fernald 1950)].

Gaura biennis L.

Oenothera biennis L.

Oenothera laciniata Hill [*O. sinuata* L., misappl. (Robinson & Fernald 1908)].

**Oenothera macrocarpa* Nutt.—[incl. *O. missouriensis* Sims (Wagner 1980)]. No nearer than southeastern Nebraska, northeastern Kansas, central Missouri, or southern Illinois.

Oenothera pilosella Raf. [*O. fruticosa* L., misappl. (Jones & Fuller 1955)].

Orobanchaceae

Conopholis americana (L.) Wallr. [*Orobanche americana* L.]—"Woods."

**Epifagus virginiana* (L.) W. P. C. Barton—"Parasite." No nearer than eastern Wisconsin, eastern Illinois, or southeastern Missouri.

Orobanche uniflora L.—"Woods."

Oxalidaceae

**Oxalis montana* Raf. [*O. acetosella* L., misappl. (Fernald 1950)]—"Woods and shady places." No nearer than central Wisconsin.

Oxalis stricta L.—"Fields."

Oxalis violacea L.—"Rocky woods."

Papaveraceae

Argemone polyanthemus (Fedde) G. B. Ownbey—"Banks of streams. S.W. of state." Referred here is Rauch's report of *A. mexicana* L., under the assumption that the discussions of James (1823) and/or Torrey (1828) were responsible for its inclusion (cf. Goodman & Lawson 1995).

Chelidonium majus L.—"Introduced. Fences, roadsides." Earliest record 1928 (Cratty 1929).

Corydalis aurea Willd.—"Woods."

Dicentra canadensis (Goldie) Walp. [*Diclytra canadensis* (Goldie) DC., nom. rej. et illeg.]—"Woods. Rocky."

Dicentra cucullaria (L.) Bernh. [*Diclytra cucullaria* (L.) DC., nom. rej.]—"Woods."

Fumaria officinalis L.—"Fields, gardens."

Sanguinaria canadensis L.—"Woods."

**Stylophorum diphyllum* (Michx.) Nutt. [*Mecanopsis diphylla* (Michx.) DC.]—"Woods." As near as eastern Missouri and southern Illinois.

Phytolaccaceae

Phytolacca americana L. [incl. *P. decandra* L. (Fernald 1950)]—"Roadsides, fields."

Plantaginaceae

Plantago major L.—"Fields, &c."

Platanaceae

Platanus occidentalis L.—"Banks of rivers."

Polemoniaceae

Polemonium reptans L.—"Banks of streams, near Burlington."

Polygalaceae

**Polygala paucifolia* Willd.—"Woods and Swamps." No nearer than eastern Minnesota, central Wisconsin, or northeastern Illinois. Reported by Thorne (1953) on the basis of a specimen collected in Linn County by George Berry (Meyer 1959).

Polygala polygama Walt.—"Fields, pastures."

Polygala senega L.—"Woods ... Prairies."

Polygonaceae

Fagopyrum esculentum Moench [*Polygonum fagopyrum* L.]—Earliest record 1898 (Cratty 1929).

Polygonum amphibium L.—"Marshes."

Polygonum aviculare L.—"Fields."

Polygonum convolvulus L.—Earliest record 1890 (Cratty 1929).

Polygonum erectum L.—"Fields."

Polygonum lapathifolium L.—"Ditches."

Polygonum persicaria L.—"Wet grounds." Earliest record 1888 (Cratty 1929).

Polygonum punctatum Ell.—"Low grounds."

Polygonum sagittatum L.

Polygonum scandens L.

Polygonum virginianum L.—"Shades."

Rumex acetosella L.—"Pastures, waste grounds." Earliest record 1888 (Cratty 1929).

Rumex altissimus A. Wood—"Wet prairies."

Rumex crispus L.—"Introduced. Cultivated grounds." Earliest record 1879 (Cratty 1929).

Rumex obtusifolius L.—"Fields, waste places." Earliest record 1888 (Cratty 1929).

Rumex occidentalis S. Wats. [*R. aquaticus* L., misappl. (Rechinger 1937)]—"Ponds."

Rumex orbiculatus A. Gray [*R. britannica* L., misappl. (Fernald 1950)]—"Muddy places."

**Rumex sanguineus* L.—"Fields." Eurasian species.

Portulacaceae

Portulaca oleracea L.—"Introduced. Indigenous on the Missouri. Gardens." Earliest record 1888 (Cratty 1929). The statement regarding native status farther west was likely derived from Nuttall (1818), James (1823), Torrey (1828), and/or Torrey and Gray (1838–43).

Ranunculaceae

Actaea pachypoda Ell. [incl. *A. alba* (L.) Mill., nom. rej. (Whittemore & Parfitt 1997)]—"Woods."

- Actaea rubra* (Ait.) Willd.—"Indians."
Anemone canadensis L. [*A. pennsylvanica* L., misappl. (Robinson & Fernald 1908)]—"Rocky place."
Anemone cylindrica A. Gray. Reported previously by Parry (1847).
Anemone quinquefolia L. [*A. nemorosa* L., misappl. (Robinson & Fernald 1908)]
Anemone virginiana L.—"Woods."
Aquilegia canadensis L.—"Rocks."
Caltha palustris L.—"Wet meadows."
Cimicifuga racemosa (L.) Nutt.—"Woods."
Clematis occidentalis (Hornem.) DC. [incl. *C. verticillaris* DC. (Whittemore & Parfitt 1997)]—"Woods."
Clematis pitcheri Torr. & A. Gray [*C. viorna* L., misappl. (Jones & Fuller 1955)]—"Woods."
Clematis virginiana L.—"Fences, &c."
**Coptis trifolia* (L.) Salisb.—"Swamps north part of state." As near as southern Minnesota and southwestern Wisconsin.
Delphinium carolinianum Walt. [incl. *D. azureum* Michx. (Warnock 1981)]—"Interior state." Reported previously by Parry (1847).
Delphinium tricornis Michx.—"Interior state."
Delphinium virescens Nutt.—Referred here is Rauch's report of *D. exaltatum* Ait., a species coming no nearer than the Ozarks of Missouri and western Ohio; the two are morphologically similar, particularly in their white or pale bluish to purple flowers (Whittemore & Parfitt 1997).
Hepatica nobilis Schreb. var. *acuta* (Pursh) Steyererm.—"Hills, south side." There is some confusion in the presentation of this and the following taxon. Rauch first cited *H. triloba* Chaix (with its homotypic synonym *Anemone hepatica* L.), giving notes for it including the habitat "Woods." This was then followed by *H. acuta*, a combination not validly published until 1891; and *H. obtusa*, which has never been validly published. It seems likely that he meant to present them as *H. triloba* var. *acuta* Pursh and *H. triloba* var. *obtusa* Pursh, respectively, as was done by Torrey & Gray (1838–43).
Hepatica nobilis Schreb. var. *obtusa* (Pursh) Steyererm.—"Hills, south side." See note under preceding.
Hydrastis canadensis L.—"Meadows and wet prairies."
Pulsatilla patens (L.) Mill. [*Anemone patens* L.]—"Dry hills."
Ranunculus abortivus L.
Ranunculus acris L.—"Meadows and wet prairies." Earliest record 1904 (Cratty 1929).
Ranunculus aquatilis L.
**Ranunculus bulbosus* L.—"Fields." Eurasian species, reported from Indianola by Bessey (1871), a report accepted by Arthur (1876) and Fitzpatrick (1899).
Ranunculus fascicularis Muhl. ex Bigel.
**Ranunculus flammula* L. var. *reptans* (L.) E. Mey. [*R. reptans* L.]—As near as southeastern Minnesota.
Ranunculus gmelinii DC. [incl. *R. purshii* Richardson (Fernald 1950)].
**Ranunculus laxicaulis* (Torr. & A. Gray) Darby [*R. flammula* L., misappl. (Jones & Fuller 1955)]—"Wet places and swamps." As near as eastern Missouri and western Illinois.
Ranunculus pennsylvanicus L. f.
Ranunculus sceleratus L.
**Xanthorhiza simplicissima* Marsh. [incl. *X. apiifolia* L'Her. (Fernald 1950)]—"Found south part of state, banks of rivers." No nearer than central Kentucky or southern Ohio.

Rhamnaceae

- Ceanothus americanus* L.—"Woods."
Rhamnus lanceolata Pursh—"On the Missouri River." Reported previously by Parry (1847). Because of this locality statement, Rauch's report of *R. alnifolia* L'Her. is referred here; that species is confined in Iowa to the northeasternmost counties. The latter

was the only species treated by Gray (1848) besides non-native *R. cathartica* L.

Rosaceae

- Agrimonia eupatoria* L.—"Fields." Eurasian species. However, as circumscribed by Torrey & Gray (1838–43), it also encompassed three species native to Iowa: *A. gryposepala* Wallr., *A. pubescens* Wallr., and *A. striata* Michx. (Kline & Sørensen 2008), and it is more likely that Rauch had one or more of these at hand.
Agrimonia parviflora Ait.—"Woods."
Amelanchier arborea (Michx. f.) Fern. [*A. canadensis* (L.) Medik., misappl. (Fernald 1950)]—"Woods."
Aronia melanocarpa (Michx.) Ell. [*Pyrus arbutifolia* (L.) L.f., misappl. (Jones & Fuller 1955)]—"Woods."
Aruncus dioicus (Walt.) Fern. [*Spiraea aruncus* L., misappl. (Fernald 1950)].
Filipendula rubra (Hill) B. L. Rob. [*Spiraea lobata* Gronov. ex Jacq. (Robinson & Fernald 1908)]—"Prairies."
Crataegus coccinea L.—"Thickets, banks of streams."
Crataegus punctata Jacq.—"Woods."
Fragaria virginiana Duchesne—"Fields, woods."
Geum canadense Jacq.—"Thickets." Referred here is Rauch's report of *G. virginianum* L., an eastern species that comes no nearer than southern Missouri, southern Illinois, and northwestern Indiana, because Torrey & Gray (1838–43) circumscribed *G. virginianum* to include *G. canadense*.
**Geum rivale* L.—"N. part of State." As near as northeastern South Dakota, central Minnesota, southwestern Wisconsin, and northern Illinois.
Geum vernum (Raf.) Torr. & A. Gray—"Thickets."
**Gillenia stipulata* (Muhl. ex Willd.) Nutt.—"Woods." As near as northeastern Missouri and western Illinois.
Malus ioensis (Wood) Britt.—"Woods." Referred here is Rauch's report of *Pyrus coronaria* L., an eastern species that comes as close as southeastern Wisconsin, northern Illinois, and central Missouri. Specimens of this species were commonly identified as *P. coronaria* prior to its recognition (Lammers 1998).
Physocarpus opulifolius (L.) Maxim. [*Spiraea opulifolia* L.]—"Banks of streams."
Potentilla palustris (L.) Scop. [*Comarum palustre* L.]—"In sphagnum swamps N. part of State."
Potentilla simplex Michx. [*P. canadensis* L., misappl. (Jones & Fuller 1955)]—"Fields."
Prunus americana Marsh.—"Woods."
Prunus pennsylvanica L. f. [*Cerasus pennsylvanica* (L. f.) Loisel.]—"Woods."
Prunus persica (L.) Batsch [*Persica vulgaris* Mill.]—"Introduced." Earliest record 1923 (Cratty 1929).
Prunus pumila L. [*Cerasus pumila* (L.) Michx.]—"Shrub sandy soil."
Prunus serotina Ehrh. [*Cerasus serotina* (Ehrh.) Loisel.]—"Woods."
Prunus virginiana L. [*Cerasus virginiana* (L.) Michx.].
Rubus allegheniensis Porter [*R. villosus* Ait., misappl. (Jones & Fuller 1955)]—"Woods."
Rubus flagellaris Willd. [*R. canadensis* L., misappl. (Jones & Fuller 1955)]—"Fields."
Rubus hispidus L.—"Damp woods."
Rubus occidentalis L.—"Fields."
**Rubus odoratus* L.—"Woods." No nearer than northern Illinois.
Rubus strigosus Michx.—"Fields."
Spiraea alba DuRoi [*S. salicifolia* L., misappl. (Jones & Fuller 1955)]—"Meadows."
**Spiraea tomentosa* L.—"Wet prairies." As near as central Minnesota, southwestern Wisconsin, northern Illinois, and southeastern Missouri.

Rubiaceae

- Cephalanthus occidentalis* L.
Galium aparine L.—“Wet thickets.”
Galium circaezans Michx.—“Woods.”
Galium tinctorium L.—“Wet woods.”
Mitchella repens L.—“N. part of State.”

Rutaceae

- Ptelea trifoliata* L. Reported previously by Parry (1847).
Zanthoxylum americanum Mill.—“Woods.”

Salicaceae

- Populus balsamifera* L.—“Woods.”
Populus deltoides W. Bartr. ex Marsh. [incl. *P. angulata* Ait. (Watson & Coulter 1889, Robinson & Fernald 1908)]—“Banks of rivers.”
Populus grandidentata Michx.
Populus tremuloides Michx.
Salix eriocephala Michx. [incl. *S. angustata* Pursh (Argus et al. 2010)]. Eilers and Roosa (1994) used the name *S. rigida* with *S. eriocephala* in synonymy, but the latter in fact has priority (Argus et al. 2010).
Salix exigua Nutt. subsp. interior (Rowlee) Cronq. [*S. longifolia* Muhl., nom. illeg.]—“Banks of streams.”
Salix humilis Marsh. [incl. *S. muehlenbergiana* Barratt ex Torr., nom. illeg. (Gray 1848)]—“Dry soils.” Rauch’s report of *S. tristis* Ait. (“Border of woods”) is referred here, where Argus et al. (2010) accorded it varietal rank.
**Salix myricoides* Muhl.—“Woods.” As near as southwestern Wisconsin and northern Illinois.
Salix nigra Marsh.—“Banks of streams.” Rauch’s report of *S. purshiana* Spreng., nom. illeg. (“Swamps”), is referred here as well; that name is based upon *S. falcata* Pursh, which Argus et al. (2010) included in this species.

Sapindaceae

- **Cardiospermum halicacabum* L.—“Banks Missouri.” As near as northern Kansas, eastern Missouri, and western Illinois. James (1825) found it to be “Very abundant on the Canadian [River in Oklahoma], two hundred miles above its confluence with the Arkansas [sic]. Undoubtedly a native.” Torrey (1828) repeated James’ information, but added to it, “On the Missouri.” Subsequently, Torrey and Gray (1838–43) construed this as, “On the Missouri and its branches, *Dr. James!*”, which may have led to its inclusion by Rauch.

Saxifragaceae

- Heuchera americana* L.
**Hydrangea arborescens* L.—“Banks of streams.” As near as north-eastern Missouri and western Illinois. Reported from Fayette by Bessey (1871) and Lee County by Arthur (1876).
Parnassia glauca Raf. [*P. palustris* L., misappl. (Jones & Fuller 1955)]—“Bogs, and shores of lakes N. part of state.”
Ribes americanum Mill. [incl. *R. floridum* L’Hér. (Fernald 1950)]—“Woods.”
Ribes cynosbati L.—“Thickets.”
Ribes hirtellum Michx.—“Woods.”
Ribes missouriense Nutt. ex Torr. & A. Gray [*R. rotundifolium* Michx., misappl. (Jones & Fuller 1955)]. Reported previously by Parry (1847).
Ribes odoratum Wendl. [*R. aureum* Pursh, misappl. (Fernald 1950)].
Ribes sativum (Rchb.) Syme [*R. rubrum* L., misappl. (Jones & Fuller 1955)]—“N. part of State.” Parry (1852) commented on the naturalization of this species around the headwaters of the Chippewa River in northern Wisconsin.

Scrophulariaceae

- Chelone glabra* L.—“Wet places.”

Gratiola virginiana L.

Linaria vulgaris Hill.—“Roadsides.” Earliest record 1883 (Cratty 1929).
Scrophularia marilandica L. [*S. nodosa* L., misappl. (Robinson & Fernald 1908)]—“Woods.”

Verbascum thapsus L.—“Fields, roadsides.” Earliest record 1881 (Cratty 1929).

Veronica americana (Raf.) Schwein. ex Benth.—“Brooks.”

Veronica officinalis L.—“Dry woods.”

Veronicastrum virginicum (L.) Farw. [*Veronica virginica* L.]—“Woods.”

Solanaceae

Datura stramonium L. [incl. *D. tatula* L. (Fernald 1950)]—“Waste places.” Earliest record 1882 (Cratty 1929).

Lycopersicon esculentum Mill. [*Solanum lycopersicum* L.]—“Introduced.”

**Nicotiana rustica* L.—“Introduced ... Cultivated by the Indians. Thought to be inferior to the Virginian.” Cultigen of tropical American origin.

**Nicotiana tabacum* L.—“Intro. ... Cultivated to a small extent in this State, and thrives well, especially in the south part. Should demand the attention of our farmers.” Cultigen of tropical American origin.

Solanum americanum Mill. [*S. nigrum* L., misappl. (Fernald 1950)]—“Way sides, &c.” Reported previously by Torrey (1843, 1845).

Solanum dulcamara L.—“Rare. Thickets, &c.” Earliest record 1897 (Cratty 1929).

**Solanum tuberosum* L.—“Introduced.” Cultigen of South American origin.

Thymeleaceae

Dirca palustris L.—“Banks of streams.”

Tiliaceae

Tilia americana L.—“Woods.”

Tilia heterophylla Vent. [incl. *T. alba* Michx. (Gray 1848)]—“Banks of Miss.”

Ulmaceae

Celtis occidentalis L.—“Woods.”

Ulmus americana L.—“Forests.”

Ulmus rubra Muhl. [incl. *U. fulva* Michx. (Fernald 1950)]—“Woods, low grounds.”

Urticaceae

Urtica dioica L.—“Waste places.” Reported previously by Torrey (1843, 1845).

Valerianaceae

Valeriana edulis Nutt. ex Torr. & A. Gray subsp. *ciliata* (Torr. & A. Gray) F. G. Mey. [*V. ciliata* Torr. & A. Gray]—“Low grounds.”

**Valeriana uliginosa* (Torr. & A. Gray) Rydb. [incl. *V. sylvatica* Sol. ex Richardson, nom. illeg. (Robinson & Fernald 1908)]—“Swamps. N. part of State.” No nearer than central Wisconsin and north-eastern Illinois.

Verbenaceae

Verbena hastata L.—“Low grounds.”

Verbena urticifolia L.—“Roadside.”

Violaceae

Hybanthus concolor (T. F. Forst.) Spreng. [*Solea concolor* (T. F. Forst.) Ging.]—“Woods.”

Viola canadensis L.

**Viola conspersa* Rchb. [incl. *V. muhlenbergii* Torr. (Robinson & Fernald 1908)]—As near as southern Minnesota and south-western Wisconsin.

Viola lanceolata L.

Viola macloskeyi Lloyd subsp. *pallens* (Banks ex DC.) M. S. Baker—Referred here is Rauch’s report of *V. rotundifolia* Michx., which

comes no nearer than southwestern Ohio, because the former was originally named as a variety of the latter (*V. rotundifolia* var. *pallens* Banks ex DC.).

Viola pedata L.

Viola pedatifida G. Don [incl. *V. delphinifolia* Nutt. (Watson & Coulter 1889)].

Viola pubescens Ait.

Viola rafinesquii Greene—Rauch's report of *V. arvensis* Murr. is referred here, in light of the nomenclatural history of field-pansies in North America (Clausen et al. 1964).

**Viola rostrata* Pursh—No nearer than southeastern Wisconsin and northwestern Indiana.

Viola sagittata Ait.

Viola sororia Willd.—Rauch's report of *V. cucullata* Ait. is referred here. *Viola cucullata* does occur as near as eastern Minnesota and southwestern Wisconsin, but this seems a better disposition in light of the confused nomenclatural history of the common blue violets (McKinney 1992).

Viola striata Ait.

Viola tricolor L.

Viola viarum Pollard—Rauch's report of *V. palmata* L. is referred here, following McKinney (1992), who synonymized the two under the latter name.

Vitaceae

Parthenocissus quinquefolia (L.) Planch. [*Ampelopsis quinquefolia* (L.) Michx.].

Vitis aestivalis Michx.

**Vitis labrusca* L.—"Woods ... The Isabella, and Catawba Grapes have been produced in cultivation from this. These thrive well especially on bluffs and hills with southern exposures. Cultivation of them demand the attention of our horticulturalists." No nearer than northwestern Indiana. The cultigens derived from it, which also include the Concord grape, constitute *V. labruscana* L. H. Bailey.

Vitis riparia Michx.

**Vitis vinifera* L.—"Naturalized. Thrives well." Eurasian cultigen.

Vitis vulpina L. [incl. *V. cordifolia* Michx. (Fernald 1950)].

ANGIOSPERMS: MONOCOTS

Alismataceae

Alisma plantago-aquatica L.—"Ponds, ditches."

Araceae

Acorus calamus L.—"Swamps."

Arisaema dracontium (L.) Schott [*Arum dracontium* L.]—"Banks of streams."

Arisaema triphyllum (L.) Schott [*Arum triphyllum* L.]—"Wet woodlands."

**Calla palustris* L.—"Wet places. North part of State." As near as eastern Minnesota, southwestern Wisconsin, and northeastern Illinois. Reported from Linn County (Anderson 1948, Beal & Monson 1954) on the basis of specimens collected in 1912 by George Berry (Meyer 1959). Recent authors have discounted the vouchers as erroneous (Eilers & Roosa 1994, Thompson 2000).

Dioscoreaceae

Dioscorea villosa L.—"Thickets." Reported previously by Parry (1847).

Iridaceae

Iris shrevei Small [*I. versicolor* L., misappl. (Beal & Monson 1954)]—"Wet grounds."

Sisyrinchium angustifolium Mill. [incl. *S. anceps* Cav. (Robinson & Fernald 1908, Fernald 1950)]—"Low grounds."

Liliaceae

**Aletris farinosa* L.—"Low grounds." As near as southwestern Wisconsin and northern Illinois.

Allium canadense L.—"Woods, prairies."

**Allium cepa* L.—"Introduced." Eurasian cultigen

Allium cernuum Roth—"Hill sides."

Allium tricoccum Sol.—"Damp woods."

Allium vineale L.—"Meadows."

Asparagus officinalis L.—"Cultivated." Earliest record 1892 (Cratty 1929).

Camassia scilloides (Raf.) Cory [incl. *Phalangium esculentum* (Ker-Gawl.) Nutt. (Gould 1942)]—"Wet prairies." Reported previously by Parry (1847).

**Chamaelirium luteum* (L.) A. Gray [incl. *Helonias dioica* (Walt.) Pursh (Gray 1848)]—"Low grounds." No nearer than southern Illinois and southern Indiana.

**Clintonia borealis* (Ait.) Raf. [*Convallaria borealis* (Ait.) Poir.]—"Woods." As near as central Minnesota and southwestern Wisconsin.

Erythronium albidum Nutt.—"Wet prairies." Reported previously by Parry (1847).

Erythronium americanum Ker-Gawl.—"Woods."

Lilium michiganense Farw. [*L. canadense* L., misappl., and *L. superbum* L., misappl. (Jones & Fuller 1955)].

Lilium philadelphicum L.

Maianthemum canadense Desf. [*Convallaria bifolia* L., misappl. (Watson & Coulter 1889)]—"Woods."

**Maianthemum trifolia* (L.) Sloboda [*Convallaria trifolia* L.]—"Wet prairies." As near as southeastern Minnesota and southern Wisconsin.

**Medeola virginiana* L.—As near as northern Illinois and northern Missouri.

Melanthium virginicum L.—"Woods." Referred here is Rauch's report of *M. hybridum* Walt., a species of the Appalachians occurring no nearer than western Pennsylvania and central Tennessee.

Ornithogalum umbellatum L.—"Introduced. Abundant." Not mentioned by Cratty (1929).

Polygonatum biflorum (Walt.) Ell. [*P. multiflorum* (L.) All., misappl. (Gray 1856)]—"Woods."

Smilacina racemosa (L.) Desf. [*Convallaria racemosa* L.]—Rauch's notes on medicinal use of this seem to be based on his personal experience rather than the literature, and may relate to his medical school dissertation (Kelly & Burrage 1920, Beatty 1991).

Smilacina stellata (L.) Desf. [*Convallaria stellata* L.]—"Banks of streams."

Smilax herbacea L.—"Low grounds."

Smilax hispida Muhl. ex Torr. [*S. rotundifolia* L., misappl. (Jones & Fuller 1955)]—"Thickets."

Trillium cernuum L.—The name used by Rauch, *T. pendulum* Willd., is properly a synonym of *T. erectum* L., an eastern species occurring no nearer than northern Illinois; however, "later usage of the name may possibly refer in part to *T. cernuum*" (Gleason 1906).

**Trillium grandiflorum* (Michx.) Salisb.—"Woods." As near as southern Minnesota, southwestern Wisconsin, and western Illinois. Isaiah Reid (1836–1911), who graduated from Yellow Springs College in nearby Kossuth in 1861 (Kerwin 2006), told Bessey (1871) that he had collected this at Burlington.

Trillium nivale Riddell—"Dr. James' farm, Des Moines county." This was located along Rock Spring, four miles southwest of Burlington, in southern Union Township (Pammel 1907–08, Benson 1968).

Trillium recurvatum Beck—"Shady woods."

**Trillium sessile* L.—"Woods." As near as northeastern Missouri and

western Illinois. Parry (1852) reported this from Davenport, while Isaiah Reid told Bessey (1871) that he had collected it at Burlington.

Uvularia grandiflora Sm.—“Woods.” Rauch’s report of *U. perfoliata* L. (“Woods, bluffs, near Burlington”) is also referred here (Fitzpatrick 1906, Jones & Fuller 1955). This is a southeastern species of similar but smaller appearance that comes no nearer than southern Indiana, western Kentucky, and northern Arkansas.

Veratrum woodii J. W. Robbins ex A. Wood—“Swamps.” Rauch’s report of *V. viride* Ait., a northern species coming no nearer than eastern Ohio or central Montana, is referred here.

Zigadenus glaucus (Nutt.) Nutt.—“Sandy places.”

Orchidaceae

Cypripedium calceolus L. var. *parviflorum* (Salisb.) Fern. [*C. parviflorum* Salisb.]—“Prairies.”

Cypripedium candidum Muhl. ex Willd.—“Prairies.” Reported previously by Parry (1847).

Goodyera pubescens (Willd.) R. Br.—“Woods.”

**Platanthera orbiculata* (Pursh) Lindl. [*Orchis orbiculata* Pursh]—“Woods.” As near as southwestern Wisconsin and northern Illinois.

Poaceae

Zea mays L.

Zizania aquatica L.—“Swamps, ponds, &c. N. part of State.”

Typhaceae

Typha latifolia L.—“Muddy pools and ditches.”

CONCLUSIONS

The most obvious question prompted by the discovery of Rauch’s (1851a) report is, “How does it compare to what we know about the Iowa flora today?” In answering this question, native and non-native species will be considered separately, in order to have a consistent standard for comparison. The number of species found in Iowa today is far greater than in 1850, due to the naturalization of plants from other regions (Cratty 1929, Eilers & Roosa 1994, Lewis 1998, Norris et al. 2001).

Native plants.—Of the 135 families with species native to Iowa (Eilers & Roosa 1994), 83 (61%) were represented in Rauch’s report. The most glaring absences were Cyperaceae, with 160 native species, followed by Potamogetonaceae (18 spp.) and Juncaceae (16 spp.). When one adds to this the fact that the report had but one of the 150 native species of Poaceae, no Amaranthaceae, and no native Chenopodiaceae, one begins to suspect that Rauch felt some aversion for apetalous herbs.

Of Iowa’s 1516 native species (Eilers & Roosa 1994), 348 (23%) were listed by Rauch. Among these were some of very rare occurrence or very limited distribution within the state, e.g., *Abies balsamea*, *Asimina triloba*, *Drosera rotundifolia*, *Filipendula rubra*, *Ranunculus gmelinii*, and *Sassafras albidum*. Conversely, the three-quarters of the native flora not listed did include several exceedingly common and conspicuous species, the sorts of things any neophyte botanist in the Midwest learns in his first season, e.g., *Aster novae-angliae* L., *Calystegia sepium* (L.) R. Br., *Phlox divaricata* L., *Rosa carolina* L., *Rudbeckia hirta* L., *Sagittaria latifolia* Willd., *Solidago canadensis* L., and *Tradescantia ohimensis* Raf. The absence of such common eye-catching plants is puzzling.

Of particular interest are the species Rauch reported that were not listed by Eilers and Roosa (1994), i.e., the 86 denoted in the list above by an asterisk. The lack of voucher specimens means that these species cannot be stated with certainty to have once been members of the Iowa flora. However, their presence in the report is suggestive of possibilities to be explored, through further collecting in the field and searches of out-of-state or neglected in-state herbaria. For some of these supernumeraries (e.g., *Dentaria diphylla*, *Lindera benzoin*), there are additional undocumented literature reports, which may increase the credibility afforded Rauch’s report.

Particularly credible are the 38 species whose current distributional limits lie immediately adjacent to Iowa, in many cases, in border counties. Some of these very well may have grown in Iowa prior to settlement, but been extirpated subsequently. Populations at the periphery of a species’ distribution may be particularly prone to extirpation in the wake of habitat loss due to agriculturalization.

The ranges of 24 of these extend into southeastern Minnesota and/or southwestern Wisconsin from the north and east. Thus it is plausible that some or all might once have been native but rare in northeastern Iowa, following the pattern of *Abies balsamea*, *Cornus canadensis*, and *Linnaea borealis* L. (Pusateri et al. 1993). These are *Aletris farinosa*, *Calla palustris*, *Clintonia borealis*, *Comptonia peregrina*, *Coptis trifolia*, *Dentaria diphylla*, *Gaultheria procumbens*, *Geum rivale*, *Maianthemum trifolia*, *Panax trifolius*, *Picea mariana*, *Pinus resinosa*, *Platanthera orbiculata*, *Ranunculus flammula*, *Salix myricoides*, *Spiraea tomentosa*, *Toxicodendron vernix*, *Trillium grandiflorum*, *Tsuga canadensis*, *Vaccinium corymbosum*, *V. macrocarpon*, *V. oxycoccos*, *Viburnum acerifolium* (in fact, recently collected in the state), and *Viola conspersa*.

The other 14 have ranges that extend into northeastern Missouri and/or western Illinois from the south and east. Thus it is plausible that some or all once may have been native but rare in southeastern Iowa, following the pattern of *Diospyros virginiana* L., *Fraxinus quadrangulata*, and *Sassafras albidum* (Davidson 1959). These are *Alnus serrulata*, *Carya glabra* (recently discovered specimens may document its existence in the state), *Cunila origanoides*, *Erigenia bulbosa*, *Eupatorium fistulosum*, *Gillenia stipulata*, *Hydrangea arborescens*, *Hypericum adpressum*, *Lindera benzoin*, *Medeola virginiana*, *Ranunculus laxicaulis*, *Sabatia angularis*, *Trifolium stoloniferum*, and *Trillium sessile*.

Another 36 supernumeraries occur in adjoining states, but not particularly closely. Although some (e.g., *Gaultheria hispidula*, *Oxalis montana*, *Polygala paucifolia*) do not tax credibility overmuch, others such as *Taxodium distichum* and *Oenothera macrocarpa* seem very unlikely to have been native to Iowa due to their habitat requirements. Such reports likely are due to misidentification of specimens or (see above) the misinterpretation of distributions reported in the literature (e.g., *Artemisia santonicum*, *Gentiana acuta*).

Seven supernumeraries are especially puzzling, as they are not native to adjacent states, or in some cases within hundreds of miles of Iowa: *Aristolochia macrophylla*, *Euphorbia ipecacuanhae*, *Ipomoea jalapa*, *Pinus palustris*, *Scutellaria integrifolia*, *Vitis labrusca*, and *Xanthorhiza simplicissima*. Most are so distinctive in appearance that it is difficult to imagine what native plant might have been mistaken for them. Given that all but one is of some economic value, one wonders if they were in fact cultivated rather than naturally occurring, without that fact being noted.

Non-native plants.—Of the 441 species treated as non-native by Eilers and Roosa (1994), Rauch listed 66 (15%). Does this mean that the remaining 355 had yet to be introduced to the state? Clearly, this is true for some (cf., Pohl 1959; Pohl & Sylvester 1962; Lammers 1997; Cusick 2002). But in light of the many common native species overlooked (see above), it does not seem wise to assume that the absence of a non-native species means it had not been introduced yet. Consequently, a detailed temporal comparison (cf., Myers & Henry 1979) is not practicable. We can say, however, that these 66 species were apparently introduced to Iowa within the first 18 years after the territory opened to settlement. In every case, this is considerably earlier than the year of first documentation reported by Cratty (1929). Many were unintentional introductions, others deliberate (cf. Mack 1991). Many have gone on to become widespread, even ubiquitous in the state, e.g., *Brassica nigra*, *Polygonum persicaria*, *Taraxacum officinale*. Others, despite their early introduction, are still quite scarce, e.g., *Chelidonium majus*, *Lithospermum arvense*, *Senecio vulgaris*.

Fifteen non-native species were listed by Rauch but not by Eilers and Roosa (1994). Three (*Origanum vulgare*, *Ranunculus bulbosus*, *Rumex sanguineus*) are sporadically naturalized in much of North America and their presence in Iowa would not be surprising. The remaining 12 were explicitly noted as cultivated: *Allium cepa*, *Cucurbita pepo*, *Euphorbia lathyris*, *Ipomoea batatas*, *Lonicera flava*, *Melissa officinalis*, *Nicotiana rustica*, *N. tabacum*, *Ricinus communis*, *Solanum tuberosum*, *Symphytum officinale*, and *Vitis vinifera*. Plants of this sort were expressly omitted by Eilers and Roosa. It is worth noting that while some cultigens (e.g., *Daucus carota*, *Mentha spicata*, *Pastinaca sativa*) had already established themselves outside gardens at this very early date, others that are naturalized now were only known to Rauch from cultivation (e.g., *Asparagus officinalis*, *Cannabis sativa*, *Maclura pomifera*).

SUMMARY

This forgotten first checklist of the Iowa flora was an amazing achievement. In a single field season of four or five months, a 22-year-old amateur newly arrived in the state documented 501 species. This represented almost one-quarter of the native species known today and 15% of the non-native, and included 87 species not currently accepted as occurring in the state. He did this at a time when there was no mechanical means of land transportation, in a frontier region lacking scholarly resources, and while establishing his first medical practice.

Despite the lack of documentary specimens, the report paints for us a picture of a time when the Iowa landscape was relatively unmolested; a time when a number of northern, eastern, and southern species may still have had peripheral populations within the state; a time before many non-native species had invaded the

state and supplanted the indigenes. It also shows us what was possible for dedicated workers to achieve in a time when floristic study was avocational, a hobby for educated men rather than the livelihood of professional botanists. Further, it is a cautionary tale, reminding us that documentary herbaria held by individuals are far more vulnerable and ephemeral than those in the custody of institutions.

Rauch's report also provides interesting insights into the medical profession of the mid-Nineteenth Century. Mainstream practitioners of that era often are characterized as practicing few therapies beyond venesection and the cathartic purging of the gastrointestinal tract, and as employing a limited pharmacopeia built around toxic mineral substances such as mercurous chloride, mercuric chloride, and potassium antimonyl tartrate (Watson 1894; Fairchild 1927; Berman 1957, 1958; Lawrence 2003). Great animosity was said to exist between them and the Thompsonian, Reformed Botanic, and Eclectic physicians, who eschewed such "heroic" practices and instead embraced a diverse array of drugs derived from plants (Beach 1833; Stuckey 1978).

The attention afforded medicinal plants by the Iowa State Medical and Chirurgical Society in its first years of existence, however, suggests that this animosity has been exaggerated. Medical societies such as this one were explicitly founded to counter the influence of those viewed by mainstream physicians as quacks and charlatans. But the review of Rauch's report by Sanford (1851) makes clear that the use of medicinal plants per se was not grounds for denigration. Rather, it was the uneducated peddlers of "Indian cures," "snake oil," and other nostrums who were condemned.

...the developement of the medical resources of the Vegetable Kingdom, must depend upon the true and legitimate physicians of the country. Abominable tricksters have deceived the people in proclaiming themselves "Eclectics," "Botanics," &c, &c, professing to draw their remedies from the Vegetable Kingdom, while we dare assert, and defy any of them to the trial, that not one of these empirics in Iowa, knows any thing about the first principles of Medical Botany. They are an ignorant race who never have made, and never will make any valuable contributions to Medical science, and the sooner the intelligent people of the State encourage a test of this kind the better.

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